NEW-YORK FARMER,

AND

AMERICAN GARDENER'S MAGAZINE.

VOL. IX.] PUBLISHED MONTHLY, AT NO. 13 NASSAU STREET, NEW-YORK, AT THREE DOLLARS A-YEAR, IN ADVANCE. [No. I.

D. K. MINOR, PROPRIETOR.] FOR JANUARY, 1836. [NEW SERIES—VOL. IV.

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☞ Subscribers to the FARMER who wish to supply *missing numbers of volume* 3, *for* 1835, will please give early information—that they may be supplied as far as possible—very few numbers having been saved from the flames.

A memorandum of each request will be kept, and the numbers will be forwarded in all cases where they can be, as soon as they can be collected in from the agents.

STATE HISTORICAL SOCIETY
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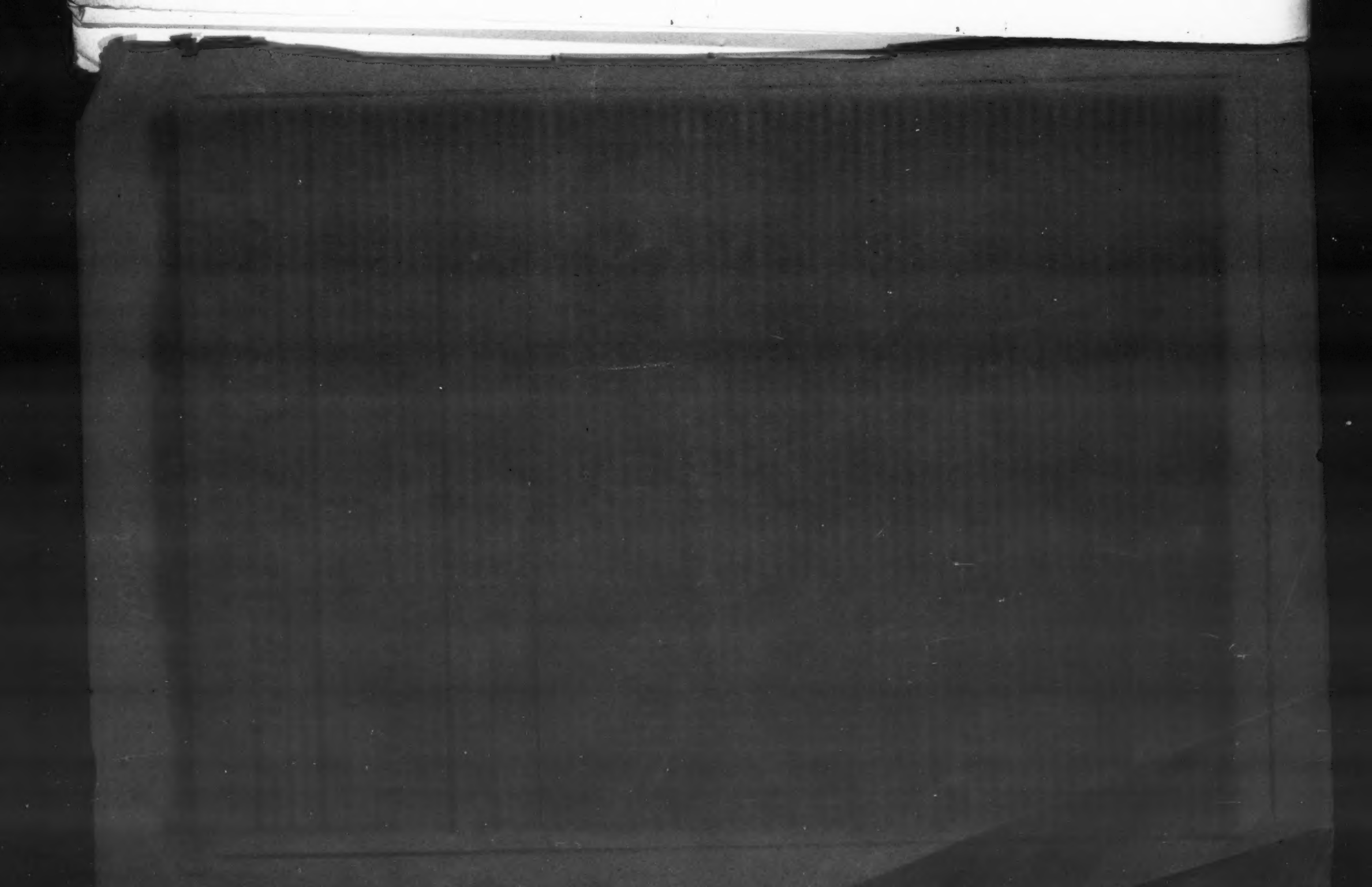

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NEW SERIES, VOL. IV,—1836.

VOL. IX.

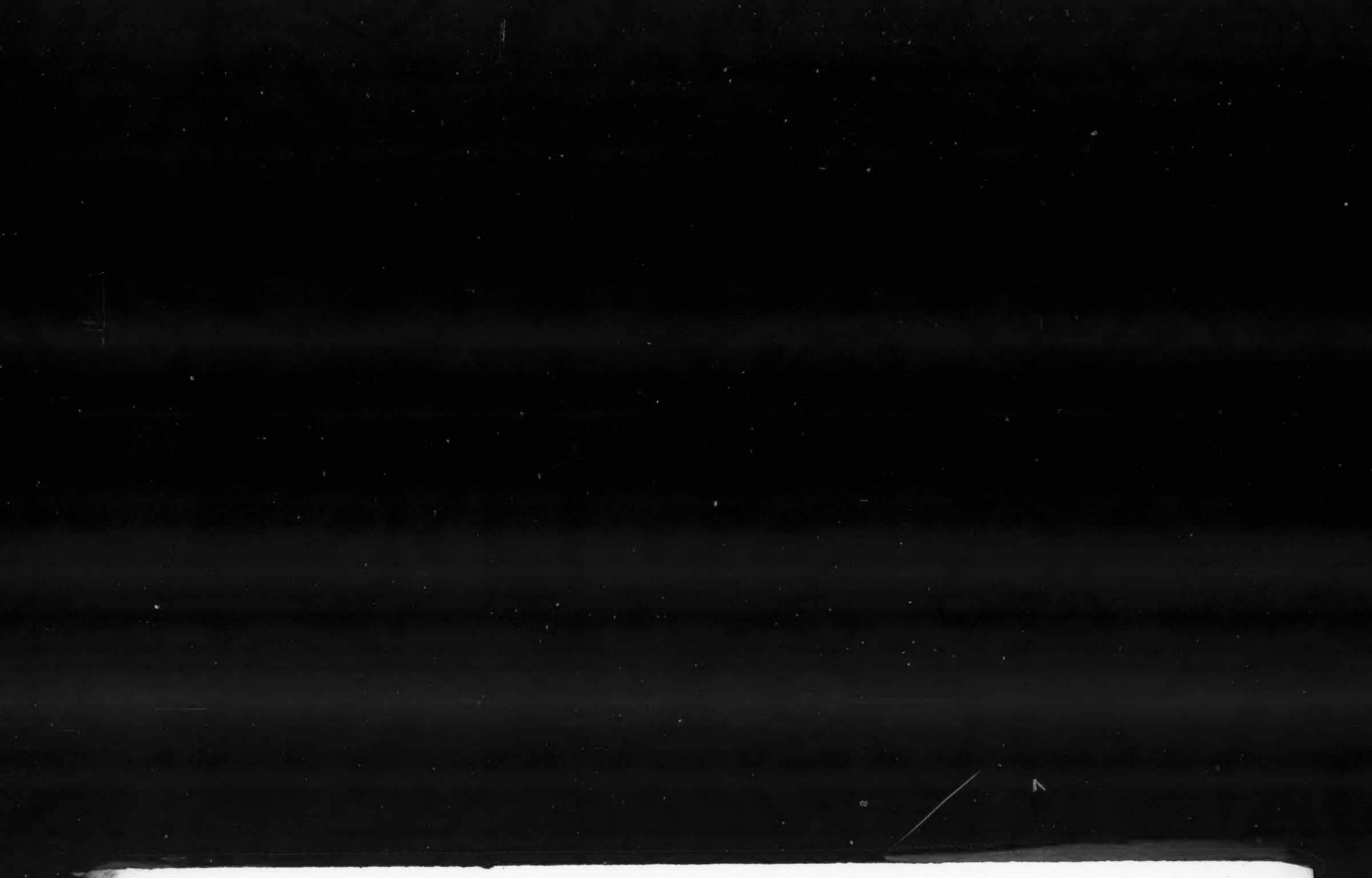
NEW-YORK:

PUBLISHED BY THE PROPRIETORS, D. K. MINOR AND GEORGE C. SCHAEFFER,

132 NASSAU-STREET.

1836.

PRICE, IN NUMBERS, THREE DOLLARS PER ANNUM, PAYABLE IN ADVANCE,—OR THREE DOLLARS AND FIFTY CENTS IN BOARDS.



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NEW-YORK FARMER.

JANUARY 1, 1836.

ONE WORD OF APOLOGY, for this long delay of the January number of the Farmer. Nearly all of the materials with which it was formerly printed, were destroyed by the late conflagration. A new *press* to be made, the necessary fixtures for an office, and mostly new type were to be procured, which, with other serious difficulties, not the least of which has been impaired health, have much longer delayed this number than was at first anticipated. It is now, however, presented to its patrons, with the best wishes of its proprietor, for their health, happiness, and prosperity.

In relation to the future management of the work, the publisher will merely say, that he hopes to be able to announce, in the next number, the consummation of an agreement, now under consideration, by which its editorial department will be under the direction and control of a distinguished agricultural writer, of a neighboring State, whose interesting and valuable communications have enriched its columns during the last year.

Renewed efforts will also be made by the proprietor and publisher, who is now relieved from other arduous duties, in the management of the *business* department of a daily newspaper—to issue it regularly, on the *first* of each month—*as soon as* he can regain the time lost by the late calamity. The *style* of the work will be *decidedly* improved.

To those correspondents who contributed to the last volume, upon a promise made in one of the numbers, of a *volume* of the work for a certain quantity of copy, he would say that he is now *unable* to comply with his promise: inasmuch as the volumes then on hand, and to which the promise related, were, with *very few* exceptions, all destroyed by the late fire, and *with* them, he had almost said his hopes of continuing the work another year.

A little time for reflection, however, and the encouragement of a few friends and liberal patrons, given in a manner similar to that exhibited by the writer of the following extract, has induced him to make renewed efforts to continue the work, and to make it worthy of a liberal patronage—i. e. a numerous list of *prompt paying subscribers*; and he therefore respectfully solicits a continuance of their contributions to its columns. A few *hundred* such patrons would certainly be very gratifying and *convenient*, just at this time—as may be easily demonstrated—without much incommoding those who may follow the example. The extract is as follows:

To the Proprietor of the New-York Farmer:

Dear Sir,—I perceive, by the accounts, that you are one of the sufferers by the late awful calamity, which devastated so large a portion of your city. I sincerely sympathise with those who have thus lost their property, and especially with you, who have, through your publications, endeavored to diffuse *useful* information, and thereby promote the interests of all.

As one of your subscribers to the New-York Farmer, a work of which I highly approve, I herewith inclose a *five* dollar bill, which will pay my subscription to September, 1837, my previous volumes having all been paid for in advance. With my best wishes for your prosperity, and the success of your very valuable periodicals, I am, very respectfuly, Your friend,

J—— A——.

N—— R——, Jan. 15th, 1836.

But, it may be asked, what is *five dollars* towards carrying on an establishment like yours? It will hardly pay for the *covers* of the work for *one month*. Very *true*, it will not, yet if all of our 750 subscribers to the work were to send us a similar letter, the proceeds would amount to *thirty-seven hundred and fifty* dollars—which, together with the $1500, due from subscribers, for *previous* volumes, would, in a very *great measure*, relieve us from the inconveniences resulting from our late losses.

Bills for *all balances due the Farmer*, and for the current year, are herewith forwarded to subscribers out of the city, who are requested to remit by mail, at our risk.

LIME AS A MANURE.—We commence publishing in this number, a very interesting article from the Farmers' Register, "*On the use of Lime as a Manure*," translated from the "Annales de l'Agriculture Francaise of 1835." It was our intention to have published a part of it in the December numbers, but other matter in type excluded it. It has been a long time in type. We shall publish the conclusion of it as soon as we can procure the copy—our number of the Register containing it having shared the common fate. We shall be much obliged to the Editor of the Register for a number containing the remainder.

AGRICULTURAL CONVENTION.—Our desire to aid in producing a full attendance at the State Agricultural Convention has been entirely frustrated.

We put in type *before the fire*, from the Cultivator of December, the Call signed by some of the most distinguished Agriculturists of the State, but that calamity prevented us from laying it before our readers until near the period appointed for the assembling of the Convention.

We give it however at this period, and also a communication from the Rev. Henry Colman, of Massachusetts, in relation to it, which will, we are confident, be read with attention.

The article from the pen of Mr. Colman, "On Cutting and Preparing Feed for Cattle and Horses," should be read by every farmer, and by every person who has cattle and horses to feed. It fully illustrates the folly of those who ridicule the idea of being benefited in their agricultural pursuits by books, or agricultural papers. And we would call the attention of those who laugh at "book farming," to the remark of the writer on Chemistry, quoted by our worthy correspondent S. B., in his communication in relation to "CHAPTAL'S CHEMISTRY, as applied to the Arts." "The Chemist has," in agricultural pursuits, "the same advantage over the man who is ignorant of that science, that the man who can see has over the blind man."

It would indeed be fortunate if those farmers who ridicule agricultural books and periodicals, had no worse habits than reading such works.

For the New-York Farmer.

AGRICULTURAL CONVENTION—ALBANY.

By. H. C.

Agricultural Convention.—We see by the public papers that it is proposed to hold a Convention of Farmers in the State of New-York on Monday, 8th February. Though not resident in the State, we trust we may be allowed to express an earnest hope that it may be fully attended. Our only regret is, that it is appointed for the first, instead of the middle of the week, for which undoubtedly there are good reasons unknown to us; but this circumstance will prevent many persons from being present, whose engagements do not permit their being absent from home on Sunday, ourselves among the number, who would have been glad to have been present as a spectator on the occasion; and have been happy to have seen in person many of the distinguished farmers of this magnificient State, now known to us only by reputation and occasional corres-

pondence. We may be allowed on every account to feel the strongest interest in the agriculture of New-York. The agricultural community is a universal fraternity, and so ought every where to consider itself.—What concerns the agriculture of New-York, equally concerns that of the neighboring States; and the light of her inquiries and improvements pours its beneficent influences upon them. We can only desire that it may be reflected from them with undiminished brightness. The competition of agricultural rivalry is free from all low and corroding passions. It stimulates only a manly and generous emulation whose effects can be no otherwise than good; and all selfish monopolies are necessarily excluded from it.

What are the particular objects of the Convention, we are not apprized. It must do good, if it be a mere interchange of kind congratulations and sympathies. It will lead to inquiries; it will be likely to elicit and diffuse much important information; it will give to the public mind a higher and juster sense of the importance and respectability of the profession of agriculture; and it will apply new stimulants to enterprise and improvement.

What is to be expected from the Legislature in the way of aid or encouragement, is not for us to conjecture, far less to prescribe. The State, we may say, we trust without giving offence, owes it to itself to foster and encourage its agriculture, as beyond all comparison its most important interest.—In former years it has done much; and the whole agricultural community are largely in debt to New-York for the publication and gratuitous distribution of three large octavo volumes on the subject of agriculture, whose value, in relation to the subjects upon which they treat, is exceeded by no publications of the kind before or since, which have fallen under our notice.

It deserves, however, the serious consideration of the Legislature and the Convention, how much good might be done, by the distribution of premiums for agricultural objects; the invention of labor-saving machines; the introduction of improved foreign stock, and the improvement of our native stock; the increase of crops, and the introduction of new objects of cultivation; and the general cultivation and management of farms. Agricultural enterprise and improvements are in no way so likely to be advanced, and agricultural associations and fairs will fall very far short of their wishes without the aid and stimulus of liberal premiums; and it is obvious and reasonable, where the money is to be expended in the State, and all the advantages are to be realized by the State, that the State should supply the means. With a view, however, of securing as far as possible the proper and judicious management of such premiums, which we consider a sacred and responsible trust, such measures as are adopted in Massachusetts seem highly expedient; where the amount, which each Agricultural Society obtains from the State Treasury, to be bestowed in premiums, depends upon the amount of contribution, which each Society collects from its own members; as for example, where a Society by its private contributions raises a fund of one thousand dollars, the income of which is annually applied in agricultural premiums, there the State bestows two hundred dollars to be applied in the same way, and so on for every thousand dollars contributed. The advantages which have arisen in Massachusetts from the bestowment of liberal premiums have been and continue to be very great; and the return from it to the State has been many thousand fold. It is impossible to say in how many forms it operates, but its effects are constantly apparent.

Another object, which will doubtless occupy the attention of the Convention, is the establishment of an Agricultural School and a Pattern Farm. In the able report submitted to the State Society in 1833 by the Committee of the Society, of which J. Buel, Esq., was Chairman, the importance and utility of such establishment were fully illustrated. We shall not venture to criticise the plans particularly submitted in this report; but with the highest respect for the gentlemen who proposed it, we considered it at the time as too unwieldy an establishment to be brought out at once; and the expenditure required as much too great to expect from the Legislature, if they hold the purse strings of the commonwealth with as close a grasp as their brethren of Massachusetts. We have given much attention to this subject; and are perfectly satisfied that with a capital of from thirty to fifty thousand dollars, and one hundred pupils over twelve years of age, at one hundred and fifty dollars per year, the price of tuition there assumed, every desirable advantage for the most substantial *general* and the most extended *agricultural* education might be secured; after the first year legal interest upon the capital stock be annually paid; and in ten years, or fifteen at farthest, the capital stock itself be entirely paid off; and ample means then would of course remain with the institution itself to extend its advantages to a degree to meet the wishes of the most liberal and enthusiastic; and thus, without subtracting from the funds of the State one dollar, which would not be ultimately returned, if it were thought best to induce the State to become the patron and founder of the institution, an establishment would grow up, which would prove one of its highest ornaments and blessings. At the same time, we should not be willing to expend more than ten thousand dollars in any way that would not be immediately available, so that in case, after an experiment of three or four years, the institution should not be likely to succeed, no great loss would in any event be incurred. We utter these as our deliberate and matured convictions; but we should deem it in these circumstances, with reference to the Convention, an act of indecorum to go farther into detail.

In their unlimited and magnificent resources, the States of New-York, Pensylvania, and Ohio, have the strongest motives to give the most patriotic, generous, and devoted encouragement, to their agricultural enterprise and improvement. May their respective governments, influenced by enlarged and just views of public policy, deal with this great interest with a liberal hand. The labors and successes of their brethren in New-England, on their sterile soil, and under an inclement sky, must be humble indeed; but however much they may distance them in a competition in which it is rashness and presumption for New-England even to enter, yet will their brethren of New-England cheer them onwards in the race of unbounded prosperity, which opens before them; under the delightful persuasion that what is done for their brethren is done for them; that national honor, improvement, and prosperity, are a common stock, in whose dividends all ultimately must share, and that the signal blessings which seem in any case to fall to the lot of any one member, must in the end be enjoyed in a greater or less measure by the whole united confederacy. H. C.

January, 1836.

For the New-York Farmer.

ON CUTTING AND PREPARING FEED FOR HORSES AND CATTLE.

BY HENRY COLMAN.

Economy of food is a matter of great importance to farmers; and this applies not only to the saving from waste by gathering up the fragments so that nothing be lost, but likewise to the mode of dispensing or applying it, that the smallest amount may be given required for the nourishment and health of the animals who are to be sustained. It is impossible to go much among farmers, without being struck by the prodigality and wastefulness with which, especially in abundant seasons, the food of our brute animals is managed; and I have often been led to the conclusion that not a third of the number is supported on most farms which might be advantageously kept; and those, likewise, from injudicious management or culpable neglect, in an inferior condition. As much discretion and care are required in the disposal of our produce, as in raising and harvesting it; and, to farmers properly regardful of their own interest, there are equal motives for the one as the other. Indeed, it is less mortifying to fail in obtaining our crops, than, after having obtained and stored them, to see them wasted through ignorance, carelessness, extravagance, or improvidence. Regularity in feeding, to the health and thrift of the animal, is almost of equal importance with abundance; and the mode or form in which

the feed is given is not of less moment both in regard to the animal himself and the uses and advantages of the feed.

This is a subject which has much occupied the attention of intelligent and inquisitive farmers; and the present general scarcity of hay and fodder throughout the country, so much increased by the early and most extraordinary severity of the first month of winter, and the consequent high prices of every kind of agricultural produce, renders the subject, at this time, of peculiar importance. I have made such experiments myself as fully to satisfy me of the great economy and advantage of cutting all long feed, hay, straw, and corn fodder, for horses and neat cattle; and am convinced that the saving may at least be put down as one third of the expense; and in some cases, where the price of hay has been very high, fully one half; and these trials have not been merely occasional and accidental, but the experience of many years. I have ample details on this subject in my own journals, but I prefer to give the experiments and opinions of others. Into these I shall go pretty largely, as far as I may deem them interesting and important.

Parkinson, in his Treatise on the Management of Live Stock, thus speaks of "feeding horses in America." Vol. ii. p. 153. "The Dutchmen have introduced a method of feeding horses in America, which I consider superior to any mode I ever saw practised. I tried it when I resided in that country, and found it both good and cheap. The method pursued is, they chop rye straw, about an inch or an inch and a half long, and put it into the manger, two or three inches thick; they then sprinkle some water over it, making it all wet alike as nearly as possible, care being taken that there is no superfluous water, as that would destroy the intention of the process; that done, they carefully mix some rye meal, finely ground, the finer the better, among the chopped straw; a very small quantity of rye meal will be sufficient for a bushel of the cut straw. This causes the horse to use his teeth much, thereby thoroughly masticating the straw, which is all tinged with the rye meal, for, being more gluey and tenacious than the meal of any other kind of corn, it will not separate or fall off by the horse moving the food about with his nose, which is one reason why it is preferred; and the straw being so long is much better than if it were cut shorter, for if it were not longer than a barley corn, the horse would swallow much of it without chewing. Walking along the streets of Philadelphia, I saw those men putting a quantity of rye straw, chopped in the manner described, to their horses. At that time, I thought it a bad way to chop straw long, as the horses I had fed with straw in that state, shuffled it about the manger, and threw much of it out, wasting some of the corn likewise. These horses stood in the streets night and day, during the most severe weather, tied to the pole of the wagon, with a trough fixed upon it, so narrow and shallow that I supposed the horses must toss a great deal of it out, but seeing they did not, I stopped to look at them. As I had not then particularly noticed their food, they told me that there was rye meal mixed with it, which, when I examined, I found cleaved to the straw like glue, it being so nicely incorporated that every straw had its portion of meal, and thus the horses did not commit any waste."

The horses to which Parkinson here refers, were the fine team horses, which, in teams of four and frequently eight horses, finely caparisoned, with wagons bearing some resemblance to a canal boat for size and tonnage, and with their jingling bells, were so frequently seen in Market street, in their journies to and from Pittsburgh across the Alleghany mountains. I have often admired them as much as Mr. Parkinson; their large stature; their fine athletic frames; their healthy condition; and have equally admired the economical mode of feeding them.

The next authority I quote is that of Richard Peters, Esq., of Philadelphia, a name always to be in the highest measure revered by the friends of an improved agriculture. A more enlightened, active, disinterested, devoted friend to the cause, has never appeared among us. In a letter dated April 8, 1817, he says, "I find a wonderful saving of provender by chaffing it. I account for the utility of chaffing, by its exposing more points for the extraction of nutriment, to the maceration of the liquids in, and the action of the stomach, or stomachs, of animals. And no provender is wasted, as it is by feeding it entire, either by negligence in servants, or uselessly passing through the viscera. I have strong hopes that the practice of chaffing will be a great relief in this season of comparative scarcity. We are so much accustomed to abundance, that we have never studied or practised the economy which necessity enforces. Three bushels of my chaffed hay weigh a stone, fourteen pounds, and this is enough for a horse, with a common allowance of oats or chopped grain, for twenty-four hours. Very little more will be sufficient for a horse standing idle, without other food. Mr. Jones saves more than the wages of a man in a year, viz. more than seven tons of hay in the keep of his four horses; for I allow five hundred pounds of hay, including waste, to keep a horse for a month. In the common and careless manner of feeding, this quantity will not do it. So that in an extensive concern, a farmer will be well paid by keeping a hand exclusively for chaffing his long provender. Yet, I believe on common farms his time would not be half occupied in this employment."

I subjoin to this an extract of a letter from Mr. Jones, the gentleman above referred to, addressed to Judge Peters, about the same time. "My attention to feeding my horses, four in number, with cut hay, by measure, commenced in the fall of last year, in consequence of a publication I saw in one of our city newspapers, in which were detailed great advantages that had been derived from adopting that practice. Experimenting on that mode of distributing hay to the number of horses above mentioned, I found, or as nearly as I could calculate, a saving of thirteen hundred pounds per month. I have since extended the practice to the whole of my farm stock of cattle, and believe the saving to be in the same ratio as stated relative to the horses. In addition to this saving, may be added the advantage of an intermixture of cut corn stalks and other descriptions of food that would not be eaten separately, and without being chaffed. My horses and cattle are all healthy, and look well."

The next statement which I shall give, is that of Thomas Williamson, from the Balt. (Eng.) Society's papers, bearing date November, 1812.

"My horses, five in number, have been regularly worked at the plough in pairs. The oxen, four in number, have worked in collars, drawing generally a stout Beaverstone plough, or a large drag and scuffler. Their labor has been constant, and rather severe. As our meadows began to fail us towards the end of September, owing to the quantity of stock upon them, it became necessary to allow the oxen more and better hay. The increased expenditure alarmed me, as the four oxen and five horses consumed no less than four tons within one month. This caused me to prohibit the use of hay in the racks, and to feed all the cattle with chaff, of which a boy can cut sufficient for daily use in two hours. My servants not only ridiculed the change, but, as far as they dared, opposed it in an underhand manner, by various pretexts and evasions. Aided by the care and vigilance of the young gentleman with me, the system of chaff feeding was fully established; and the quantity needed for the horses, and for the oxen, separately, ascertained.

"One hundred weight of hay was found to yield 20 bushels of chaff pressed into the measure, and piled as high as it could safely be carried; consequently each bushel weighed about 5½ lbs. It was found that the five horses would eat twelve bushels of chaff during the twenty-four hours; and that the four oxen would consume an equal quantity in the same time. Ever since the oxen have been fed with chaff only, they have very evidently improved in condition, as have also the horses, although their work has latterly been on heavier soil, and of course more severe than formerly. Twenty-four bushels of chaff, at 20 bushels to the cwt., amount to about 21½ tons yearly; which, deducted from 48 tons, (the quantity we were consuming within the year,) gives a saving of about 26½ tons, or more than half.

"I have, however, carried the retrenchment further, by cutting in bean stalks to

the extent of about a quarter of the chaff. These being laid uppermost in the cutting trough, keep the hay well pressed, and cause it to be cut more regularly. Thus we now use about 25 cwt. of hay monthly, instead of four tons."

The next statement which I shall give, is Benjamin Hale's account of the saving made by the use of Hotchkiss' Straw Cutter, employed to cut hay and straw as fodder for horses, as given in the Mass. Ag. Reports, vol. iv. p. 400.

Mr. Hale is proprietor of a line of stages running between Newburyport and Boston.

The whole amount of hay purchased from April 1, to October 1, 1816, (six months,) and used at the stage stable, was,

tons.	cwt.	qrs.	lbs.
32	4	0	10

At 25 dollars per ton, (the lowest price at which hay was purchased in 1816,) amounted to $800 00

From October 1st, 1816, to April 1st, 1817, whole amount of hay and straw purchased for, and consumed by, the same number of horses, viz.

	tons.	cwt.	qrs.	lbs.		
Straw,	16	13	3	10	160.23	510 23
Hay,	13	14	1	00	350.00	

Deduct on hand, April 1st, 1817, by estimation, four tons more than there was Oct. 1st, 1816, at $25 per ton, 100 00

Saving by the use of straw cutter, 4 months of the last 6 months, or the difference in expense in feeding with cut fodder and that which is uncut, 389 77

Whole amount of hay used for the horses of the Salem stage, 25 in number, from April 1st, to October 1st, 1816, viz.

tons.	cwt.	qrs.	lbs.
22	0	0	0

At $30 per ton, (lowest price in Salem,) 660 00

Whole amount consumed by the same number of horses from Oct. 1st, 1816, to April 1st, 1817:

	tons	cwt.	qrs.	lbs.		
Straw,	15	13	0	0	187.80	268 80
Hay,	2	15	0	0	81.00	

Saving in using chopped fodder five months, 391 20

Total saving in using the straw cutter nine months, viz.

At Newburyport, 4 mon.	389.77
At Salem, 5 months,	391.20
Total,	780 97

The member of the Board of Trustees of the Mass. Ag. Society, to whom the above account was communicated by Mr. Hale, was informed by that gentleman, that he used no more grain from October, 1816, to April, 1817, than was used from April, 1816, to October, 1816."

I shall quote next from the "Complete Grazier."

"Steamed chaff (meaning the refuse of wheat, &c.) may be given to milch cows, with great advantage. For this important fact in rural economy, the Grazier is indebted to the ingenious and persevering experiments of T. C. Curwen, Esq., whose judicious zeal for the improvement of agriculture is too well known to require any eulogy. In giving the steamed chaff to the cattle, 2 lbs. of oil cake are mixed with one stone of chaff, and the milch cows and oxen are fed with it morning and evening, having an allowance of one stone at each time. One great advantage attending this method was, that most, if not all, the milch cows were in such a condition, that, with a few weeks feeding after they were dry, they became fit for the shambles, with very little loss from the first cost. As a substitute for chaff and oil cake, Mr. C. recommends cut hay, which, when steamed, would make a much superior food; and, he entertains no doubt, would greatly augment the milk, as well as benefit the health and condition of the animals. Of this there can be little question; for straw, or even the corn (wheat) husk, which is said to contain more nutriment, can add but little to the product of milk; it may keep some animals from starving, but it will never improve their flesh; and it may be received as an axiom, in feeding all animals, that the value of the food is in proportion to the quantity of nutritive matter contained in its component parts. Bulk is also necessary to sustain the action of the stomach; but it serves no other purpose."

In another place, after referring to Parkinson's account of his horse keeping, before mentioned, the writer goes on to say, "but to have occasioned this great expense, the straw must have been chopped very fine, which is not merely unnecessary, but even objectionable; for mastication will be better effected if it be cut rather long; and that operation is of the first necessity as regards the digestion, and consequently the nutriment of the animal. In the south of Europe, more particularly in Spain, where many fine horses are bred, hay is generally unknown; and the straw, upon which, with barley, they are wholly kept, is always given only partially cut as rack meat, and never as chaff. In Kent, however, but more especially in the eastern part of that county, the teams are kept entirely upon short-cut straw and unthrashed oats, given in the manger; the oat sheaves being estimated to produce above seven bushels of grain weekly for a team of four horses; or if clear corn be given, the common allowance is four bushels of oats and two of beans; and some farmers, it appears, neither allow corn nor hay, but give about two hundred weight of beans, with an unlimited quantity of straw, and perhaps a small portion of sanfoin hay cut into chaff."

My next reference will be to some experiments detailed by Sir John Lindain: for though the mode of feeding adopted in England differs materially from that used in this country, they knowing nothing of our Indian corn, and we as little of their horse bean, yet the experiments are, on every account, valuable and instructive.

"Mr. Willan, who is interested in so many stage coaches to and from London, formerly used to consume every year about 10,000 quarters of oats from the port of London, and about 2,000 quarters were bought at country markets, for the horses he kept two or three stages distant from London. Prior to the high prices of last year he allowed his horses as much corn and hay as they would eat; and on an average they consumed 2 pecks or 16 quarts of oats per day, and every 20 horses had a load of 18 cwt. of hay per week. For the last twenty years, with the exception of the two last, the best hay (which it was always necessary to purchase for stage coach horses) might, on an average, be about £5 per load; but last year it rose from £6 to even £10 per load; and oats this year (1812) rose from 20s. to £4 and upwards, per quarter; at which price, if oats had been given in the usual quantity, it would have been impossible to carry on the business of stage coaches. It became necessary, therefore, either to give up that concern, or to hit upon some new mode of feeding horses.

"Beans had formerly been purchased, before the new harvest began, at from £3 to £3 10s. per quarter. In the expectation of beans continuing at nearly this rate, Mr. Willan was led to erect a machine to be worked by two horses, for crushing beans and cutting chaff at the same time; and for some time, he found considerable advantage from the practice; but beans gradually rose in price, until they reached £6 per quarter. Even at that price, however, he finds it of advantage to use *old* beans, mixed with new oats and chaff, in the following manner. Having harvested well a considerable quantity of oats, it occurred to him that it would be of use, instead of threshing the corn, (i.e. the oats, H. C.) to cut the straw and oats together into chaff; and now to each horse he gives per day, the following quantities of food, namely: 1. Half a bushel of cut chaff, amongst which there is probably about a quarter peck of oats, but which must vary according to the season, whether favorable to the production of straw or corn, (oats.) 2. Half a peck of crushed old beans; and, 3. Half a peck of new oats. This mode of feeding Mr. Willan considers as healthful for the horse, and enables him to go through the severest labor. The public advantages to be derived from this mode of feeding horses, are of the greatest importance. The expense of feeding horses may thus be considerably reduced, the benefit of which is obvious. Even the hardest working horses may thus be fed either altogether without hay, or with a less proportion of it, which will render it unnecessary to keep such extensive and most valuable tracts of land in a state of permanent grass, when the produce can be so much increased by the use of the plough."

* * * * * * *

"An eminent coach-master in Lancashire, (Mr. Brotherton, of Rainhill,) has likewise favored me with some important information regarding his improved mode of feeding horses. He had been accustomed, from 1802 to 1811, to allow 8 horses, every 24 hours, three Winchester bushels of oats and one bushel of beans, but no hay or chaff. During that period, he lost a great number of horses every year, to the amount of from 14 to 17 on an average, which he attributes to his having given them too much corn, and more than the stomach could digest. This led him to try a small proportion of hay; and he afterwards adopted the following plan:

To every 8 horses he allows one bushel of oats, one bushel of beans, and three bushels of cut hay, and straw or clover mixed, of the best sort that can be purchased, the expense of which he thus estimates:—

One bushel beans,	£0	12s.	0d.
One bushel oats,	0	7	0
Three bushels cut hay, straw and clover,		1	
Expense per day for 8 horses,	£1	0	0

That is 17s. 6d. for each horse per week, besides 5s. worth of hay per week, making the expense of each horse per week, 22s. 6d. A considerable saving thus arises, compared to the feeding wholly with oats, besides a great reduction on the quantity of oats consumed. Mr. Brotherton never crushes his beans or oats, thinking it unnecessary, when the horses get cut clover, hay and straw, mixed with their corn. But he admits before they got that mixture, that the beans and oats often passed whole; and it would certainly be advisable to adopt the crushing plan, more especially with very young or very aged horses, as the necessary machinery can easily be had, attached to a threshing mill. He cuts the hay and straw very short, and gives it a preference to clover, if it has been cut before it has been seeded, and is well harvested. He never threshes his oats, if well harvested, but cuts them in the machine altogether. This, however, renders it impossible exactly to ascertain the difference of expense between the two systems. His horses are now as healthy and able to do their work as ever he knew them; and he has lost only one horse since he adopted the new plan. If he had fed his horses according to the former plan, at the price which corn now fetches, it would have cost him, at best, 1l. 16s. 2d. for each horse per week, but according to the new plan, they only cost, as has been already stated, 1l. 2s. 6d., making a difference of no less a sum than 13s. 8d. on each horse per week, or 35l. 10s. 8d. per annum. Such experiments as these, conducted on a great scale, cannot be too generally known and practised."

"It is well known (continues Lindain) that a bushel of corn, when boiled or bruised, or a hundred weight of hay or straw, when cut, will go much farther than when entire. If a horse is compelled to grind or cut these articles with his teeth, the labor occasions a diminution of strength, and the additional time it requires lessens that which might be devoted to repose. It is now generally admitted that the saliva is of less use in promoting digestion, than was formerly believed to be the case; and that this important operation is performed chiefly by the gastric juices of the stomach.—If therefore the nourishment is put into the stomach in a state fit for the gastric juice to eat upon it, whether that is performed by machinery from without, or by the teeth within, is of little consequence."

My next statement will be that of William Phillips, Esq. dated Philadelphia, June 10, 1824, and addressed to John Hose Powell, Esq.

"In reply to your inquiry respecting my experiments in the use of corn fodder, and opinion of Eastman's Chaff Cutter, which I have had in operation for some time, I with pleasure communicate the entire satisfaction which both have afforded me. It is hardly necessary to say that the corn is cut before the sap is dry, stacked in the field, the fodder bound in bundles after it is husked, and preserved in as dry a state as possible.

* * * * * * *

Since I have used fodder thus prepared, I have kept from twenty-six to thirty-five head of cattle, besides horses and sheep during the winter, and have used at least ten loads of hay less than when I kept only spring my cattle were in better order than twelve. This usual."

The next statement which I shall quote, is that of Amos Sheldon, Esq, of Beverly, Mass., a gentleman with whose character as an intelligent, excellent, and successful farmer, I have the pleasure to be well acquainted.

Beverly, Jan. 25, 1834.

Mr. J. R. Newell,

Dear Sir: It is with pleasure that I comply with your request, asking the result of my experience on the subject of feeding stock. My stock consists of fifty-one head, namely: 8 horses, 4 oxen, 35 cows, and 2 yearlings. This stock was fed in the usual way, with English salt and fresh meadow hay, with meal and potatoes, as their case required, until the 1st of December last, at which time I commenced chopping my hay. In giving my experience, I must, in some measure, ask the privilege of a Yankee, viz. that of guessing; but in this case I think I can guess pretty correctly, as much of the hay has been loaded in consequence of having to remove it from one barn to another, and calculating the number of days a load would last, the result is as follows:

700 lbs. of English hay, at $16 per ton,			$5 60
200 " fresh, do.	at $4	do.	40
100 " salt do.	at 8	do.	40
3 bushels corn meal,			2 25
8 bushels long red poatoes,			1 60
Per day,			$10 25

400 lbs. English hay chopped, at $16 per ton,			$3 20
100 " fresh	do.	4 do.	20
100 " salt	do.	8 do.	40
3 bushels corn meal,			2 25
4 " long red potatoes chopped,			80
140 gallons pure water,			0 00
1 man at 8 dollars per month,			31
Board of man at $1 50 per week,			23
Per day,			$7 39

Balance in favor of straw cutter, $2.86 cts. per day.

In addition to the above balance may be added an increase of six gallons of milk, and likewise something for the improvement of the condition of my whole stock."

The above statement being in some respects deficient, and especially wanting the exactness which is extremely desirable in such cases, I took the liberty, through the columns of the N. E. Farmer, of addressing some inquiries to Mr. Sheldon; and some extracts from his reply, which I here subjoin, will be read with interest.—"As it respects the queries of H. C., concerning the potatoes, &c., I will here give an account of the whole process. In a central part of my barn, I have a room 18 by 12 feet; this is ceiled with boards, which make it tight and warm. In this room is a pump and a pen 10 by 10 feet, which is made water tight; the hay being chopped and thrown into a heap, outside this room, early in the morning a sufficient quantity is put into the pen to feed the whole stock once, to which is added water enough to moisten it, then meal and potatoes, when the whole is mixed with a four tined fork, until every part of the hay receives its proportion of the meal and potatoes, then it is given to the cattle in baskets. This process is followed three times each day, morning, noon, and sunset. The whole of which is performed, excepting giving it to the cattle, by a man whom I hire for eight dollars per month. In regard to chopping the potatoes, I do not think it is of much consequence, excepting they are more easily and uniformly distributed among the hay, which is of some consequence, as when not chopped the cattle will devour the potatoes first, when I think it is better that the whole should be eaten together."

I subjoin, in the last place, the experiment of a friend, which came under my own observation; a gentleman whose skill and good management in all the departments of his husbandry, entitle him to great respect. I take it from my note book of March last.

Mr. M. R. Clapp, of Westminster, Vt., has now for three weeks kept two horses, two colts, two cows, and five young cattle, from 2 to 3 years old, upon feed prepared thus: 12 bushels of rye or oat straw cut fine and mixed wet with 24 quarts of cob

meal, (Indian corn ground on the cob) furnishes the supply for a day. The horses have had a little hay, but two thirds of their living has been from this supply. The cows, since calving, have had a little hay. The colts had a little hay at first, as this food scoured them too severely; but this, with these small exceptions, constitutes the feed of the stock. The cows were rather thin—the horses, colts, and young cattle, in excellent condition. Three men, in half a day, cut enough to last one week—12 bushels of cut straw weigh about 100 lbs., or 8 lbs. per bushel basket full.

I submit the above statements to the reader, without further comment, being unwilling to extend this long communication. The intelligent farmer will at least find in them strong and encouraging motives for farther experiments. H. COLMAN.

Meadowbanks, January, 1836.

For the New-York Farmer.

AGRICULTURAL PROFESSORSHIP.

By H. C.

We saw it announced, a short time since, that within a few days $200,000 had been subscribed by private individuals in Buffalo, for the establishment of several professorships in the new college to be instituted in that flourishing town. This is, it is believed, one of the most extraordinary examples of liberality, that is on record in the country; and we can hardly say what may not be expected from a community so public spirited and munificent. We regretted, however, that among the various professorships established or proposed, there should not have been one of Agriculture and the Useful Arts. This is a want which we shall hope to see supplied presently at all our colleges. With it might be very properly connected the subject of political economy; and such a department would, if well filled, confer very great advantages. Natural History is a kindred subject, and might fall under the same head. We mean nothing sectarian and nothing offensive, when we say, that half the money now expended in many of our colleges in teaching controversial theology, would, if applied in this way, much more effectually serve the cause of human comfort, good morals, humanity, and true religion. H. C.

For the New-York Farmer.

ON THE RHUS COTINUS.

By W. PARTRIDGE.

So rapidly have the arts and manufactures advanced in this country since the year 1811, that our agriculturists have not kept pace with them in raising new articles to supply their creative demands.—This may mostly arise from the want of having such new articles as can be profitably raised by them brought fairly to their notice. I shall, therefore, avail myself of the columns of your paper, to remind them of such materials within their power to raise, as I esteem it their interest to produce.

In such an extensive country as ours, possessing so varied a climate, and every quality of soil, it is highly important we should raise every article that can be profitable to the cultivator.

There are two species of sumach, admirably adapted to our soil and climate, the consumption of one of them, now imported, being more than three thousand tons per annum, and the other never used, for the simple reason that it has never been brought here. The latter is the one I shall now bring to the notice of our farmers, and the other at some future period, when I have time to spare from other active employments. I am induced to give preference to the latter, because being a light and bulky article, it cannot be brought here without paying more freight per ton than the original cost in the countries now supplying it. The expense of transit is probably the cause of its non-importation.

The Rhus Cotinus, or Venice Sumach, a perennial, deciduous shrub, is an important article in dying. It is known, by workmen in England, as young fustic; the stem and trunk of the shrub, and the root, are bought and employed for dying an orange yellow. The leaves and stalk, when bruised, have an aromatic but acid scent. It bears no berries, and the cultivation will have to be extended by suckers. It is now used solely as an ornamental shrub, and there is none more beautiful when in blossom, the flower being a bright pearly drab, large and flossy, beautifully contrasting with the deep green leaf. It bears a small black seed, which I am informed will not re-produce. It thrives well in all parts of this country where I have seen it planted, and I have observed it in Massachusetts, Rhode Island, Connecticut, New-York, New-Jersey, Pennsylvania, Delaware, and Kentucky; therefore there can be no doubt of its succeeding, if common care is taken in cultivating it. The trunk and limbs may be cut for use when they are one and a quarter inch diameter, or any larger size, if sound. They should be cut early in the spring, when the bark will easily strip off. When the bark is off and the wood dried, they are ready for market. When cut the inside will show rings of a golden color, and darker, from the heart to the sap; the sap being thick and white.

I would recommend those who are disposed to cultivate this shrub, to plant at first only three or four of them, and extend the cultivation from their suckers. It would be best to plant them round their fields, or near their wood land, where they would not interfere with any of their grain crops. I have seen some of these shrubs in the nursery of Messrs. Downings, near Newburgh, Orange co., and have brought it to their notice as a valuable dying drug.—Those who are disposed to cultivate them should inquire, of the nurserymen from whom they purchase, every particular relative to planting and extending the cultivation.

I have no doubt the consumption would be very large, so large as to keep pace with the supply for many years to come. I believe, from the numerous inquiries made for it, that I could now sell one hundred tons annually, and would be willing to give a liberal price for the first two or three tons brought to market.

WM. PARTRIDGE,
34 Cliff Street, New-York.

We hope the preceding communication will attract the attention of some of our readers who can make an experiment. It is well worth an effort; as it is true, as the writer observes, that the agriculturists of this country have not kept pace in the increase in number of profitable articles of cultivation, with the arts and manufactures. —[ED. N. Y. F.]

For the New-York Farmer.

ON THE TEAZLE PLANT.

By W. P.

I observe, Sir, in your last number, it is said, "A farmer in Williamsburgh, Massachusetts, sold his crop of teazles for one thousand dollars." The writer of the article goes on to say, "the farm is an ordinary one; but this is a very extraordinary case. It may be done in a century. One swallow does not make a summer. The demand is very limited, and they had become scarce. A few acres of ground would, under good cultivation, produce enough for all the manufactories in the country; and the market would soon be glutted."

The whole of this article is evidently the product of a person who knows nothing of the subject on which he has treated. It is an extraordinary portion of human imbecility, that man should be more confident in giving his opinion on subjects with which he is totally unacquainted, than on those he thoroughly understands.

The cardacus fullonus, or teazle plant, is an important bur to the woollen manufacturer, nor is it an article of small consumption, to be raised on a few acres well cultivated. The crop of last year was about forty-two millions, thirty in the States east of New-York, and twelve in the middle and western States; and the land under cultivation for this plant exceeded one thousand acres. The price this year is by no means extraordinary, for it has been as high four cropping seasons out of twelve. Once during that time, they have been three times as high, and last spring they sold at more than double the price of the late crop. The crop was short this year, but the market has been fully supplied by importation. Twenty-two millions have been imported this year, and eight more are expected. The importations are principally from France and England, and the demand for this country has advanced the price in both those markets.

I will quote a few facts to prove that the teazle crop is not so very uncertain with regard to a remunerating price, as represented by your correspondent.

A farmer at Rahway, New-Jersey, has sold his crop in New-York for many years. He plants less than two acres of ground. The last crop he sold for four hundred and six dollars; and, I believe, has never more than once obtained a less sum for the crop of a season than three hundred dollars.

A farmer in Dutchess county, off little more than five acres, sold his last crop for one thousand dollars; and being contracted for before any advance took place, he only obtained the average price.

Another farmer, in Orange county, sold his crop this year for rising three t housand dollars, product of thirteen acres.

The teazle is a very uncertain crop, subject to be injured by spring frosts and thaws. The average crops do not probably exceed forty thousand, and a full crop will reach to one hundred and twenty thousand. If it requires seventeen hundred acres of land to raise a supply for consumption by average crops, it will be easy to account for the great depression resulting from two or three successive years of full crops. W. P.

[We are obliged to W. P. for the above communication, and will thank him to furnish us with an account of the mode of cultivation.]

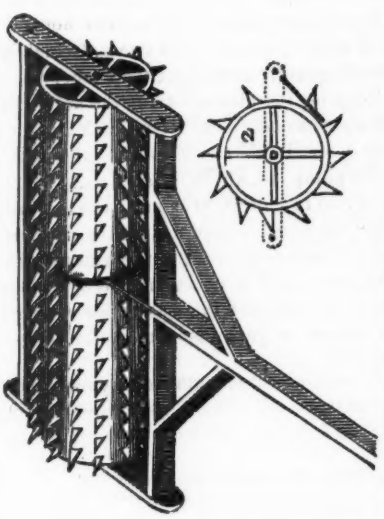
Revolving Press Harrow.—We have had an opportunity to examine the model of a new agricultural implement, invented by Mr. John C. Concklin, of Peekskill, Westchester county, which he calls the "*Revolving Press Harrow.*" One great object of this implement appears to be to prepare for planting, or other cultivation, by loosening the soil of green sward recently turned over, without the liability of disarranging the turf, and of exposing the grass again to view, which attends the common harrow or drag Its operation is, first, to press more closely the furrow or sod, by acting as a roller, while the teeth, in leaving the earth, act as levers, lightening up the soil behind the roller without disturbing the sod—thus leaving the surface, and to some depth, light and ready for the seed.

Another important use to which the inventor considers it applicable, is, to scarify and lighten up meadow, or grass land, which has become sward-bound, where it is desirable to continue to use the scythe instead of the plough.

It may also be used as, and answer every purpose of, a roller alone, by first removing the teeth, which may be readily done.

From the explanations of Mr. Concklin, and the appearance of the model, we are inclined to think very favorably of the implement, and would therefore call the attention of our readers to the following drawing and description of it.

Mr. Concklin was the pantentee of a beautiful portable forge for silversmiths, and other purposes, which we saw at the shop of a friend last summer, and to which we alluded in the August number of the Mechanics' Magazine, p. 57, but of which we then knew not the inventor. We considered that a useful invention, and it has, as we are informed, proved so,—and the one now under consideration will, we trust, prove equally so, both to the public and the inventor.



John C. Concklin's Patent Revolving Press Harrow, for Improving Sward and Arable Land.—Fig. 2 represents the end of one of the cylinders, showing in particular the manner in which the teeth, which are attached to the frame behind, operates in cleaning the teeth of the rollers.

This machine consists of two cylinders, each 20 inches in diameter and 3 feet long, formed of cast-iron staves, which are bolted to end pieces or heads, in the centre of which are boxes similar to those of a cart wheel, and revolves on an axle in the same manner. The two cylinders are placed on one axle, which is made of wood, in a straight line, the two inner ends coming nearly in contact with each other. A wooden frame is then made, which encircles the whole, and is framed to the axle at each end. To the centre of the frame in front the tongue is placed, and made sufficiently strong by means of braces.

In the surface of the cylinders a sufficient number of holes are made, which receive the teeth made of wrought or cast-iron, of any convenient length or size, so that by the revolving of the cylinders or rollers upon sward or other land, it will become sufficiently scarified or loosened to answer the required purpose. The teeth are fastened into the cylinders by means of keys or nuts upon the inside, and may be removed by taking off one or more of the staves, when a roller only is wanting.

On the under side of the frame that passes directly behind the cylinders or rollers, teeth are also placed, extending downwards, with the points coming nearly in contact with the cylinders, and passing between the rows of teeth thereon, by means of which all turf, stones, or other substance, which might have a tendency to clog them, are removed.

This harrow is constructed like the cast-iron roller, except that it has teeth, and the cylinder is in two parts, which enables it to turn on its centre.

Important to Farmers.—Just published, by Willard, Gray & Co., Boston, a work, entitled Chemistry Applied to the Arts. By John Anthony Chaptal, Count of Chantelaup, Peer of France, Member of the Institute, &c. First American edition, translated from the second French edition.

To every person who is, or ever intends to be, an agriculturist, we would not only recommend, but earnestly entreat, to purchase a copy of the above work. If he has but one acre of ground, and is unable to purchase but one book on any earthly subject, we would advise him to let this be the one, as he will find it of more value than any other, or even than all others put together. It has been remarked by a writer on chemistry, and we believe by the author of the above book, 'The chemist has the same advantage over the man who is ignorant of that science, as the man who can see has over a blind man. The blind man may walk with a degree of safety in a beaten and familiar track, and even with a handsomer gate than the man who can see. But if he gets ever so little out of that track, or meets with any new interruption in it, he stumbles over every thing in his way, without knowing how he got out of the track, or how to get in again, or how to remove the obstacle; while the man who can see, is equally safe in a new path, as in an old one.'

As we remarked above, if a man has but one acre of land, and can obtain one dollar and fifty cents to purchase one of those books, and can read and understand it, it will enable him to double the product of that acre.

To those who are opposed to book farming, and who boast that they know how to plant and hoe their corn without consulting a book, we would only remark, that facts are stubborn things; and there is not a man of that description, who cannot, if he searches, find a man whose acre of corn, perhaps with the same as his labor of planting and hoeing, yields twice as many bushels as his; and seeing this, if he is capable of reflection, he will discover that success in agriculture does not depend altogether on skill in planting, hoeing, or sowing, but even in a much greater degree upon the knowledge and practice of fertilizing his ground. He will consider that if he planted an acre of barren sand, and his neighbor planted an adjoining acre of a deep rich soil, his neighbor would receive

an ample crop, while he would lose his labor. If he reflects a little farther on the subject, he will find out, that by proper management, his acre of sand may be brought to any degree of fertility, and that his neighbor's rich acre may, by a contrary course, be reduced to barrenness. If he is at a loss to know how this change is to be effected, let him purchase Chaptal's Agricultural Chemistry, and it will unfold the whole mystery in plain and easy language, which if he can read it, he cannot fail to understand. S. B.

For the New-York Farmer.

MANAGEMENT OF PUMPS IN SEVERE FROSTY WEATHER.

By W. R.

Mr. Minor: As many of your readers, like myself, may have experienced much inconvenience from the freezing up of their pumps in winter, and incurred an additional expense in the purchase of water for domestic purposes, I shall state for your and their information the simple plan I have hitherto adopted with my pump to prevent its freezing: which, with a very little extra trouble of twice drawing the boxes yearly, insurest he use of the pump, and consequently of the water, in the severest weather.

First, I take out the spear with the upper box, then draw out the lower box, or get some one to do it: at or near the centre of the clapper of the lower box I bore a hole with a gimblet, about the size of a 12 penny nail, (this hole is to suffer the pump to *lose the water* in 5 or 6 minutes after each using,) this done, I place the boxes in the pump as before; and by turning into it about two gallons of water* (all at once) the pump may be *fetched*, as it is called, by a common well known operation of working the handle half a minute, with very *short* and *quick* strokes. When a supply of water is obtained for present purposes, an additional two or three gallons must be saved and kept from freezing to *fetch* the pump with, whenever a fresh supply of water is again wanted. The hole through the clapper of the lower box, as before observed, allowing the pump to *lose the water* in 5 or 6 minutes after each using, leaves all that part of the pump above the surface of the water in the well empty; consequently there will be no water left above the box *to* freeze.

The foregoing has been the practice with my pump, and I derive great benefit from it. I last winter neglected the precaution till too late, and had to buy water about five months in consequence. The little trouble here pointed out, has no proportion to the inconvenience arising out of the pump's freezing up; incurring the expense of having to buy water, or to send for it a great distance. The pump best suited for winter use, and indeed for all domestic purposes, is the common ship pump, which admits of easily putting the water in at the top, at each operation.

In the spring of the year, when there is nothing further to fear from the frost, draw the boxes again, and screw a short iron screw into the hole of the lower box clapper, which will cause the pump to *keep* water, until the precaution against freezing again becomes necessary on the approach of winter. If the upper box should work rather tight, the clapper of that may be perforated also.

Street pumps, however exposed, may also be made equally useful, without housing in, or stuffing around with straw, (which is more frequently inefficient than otherwise) by adopting the plan of having the nozzle or exit spout to consist of a stop-cock; and to have a stuffing box or air-tight valve fitted on the pump rod, above the stop-cock, which being put in motion to exhaust the air, will cause the water to rise up into the vacuum, and become subservient to the water boxes. The lower, and if necessary the upper box clappers, to be perforated as in the common out house or yard pump, as before recommended.

If you think these hints worth your notice, please insert them in the Mechanic's Magazine, and you may perhaps hear again from

W. REYNOLDS.

St. John's, New-Brunswick, Dec 14, 1835.

* Or as much as may be necessary to cover the spear box.

The following letter is from a friend now on a tour through the West, from whom we hope to receive many others. Should he not forget us amidst the numerous objects of interest with which he will meet on his way, our readers will hear from him again.

For the New-York Farmer.

LETTER I.

QUESTION—Where you bound, stranger?
ANSWER—I am going to the Far West, sir.

Lancaster, Penn., Nov 10, 1835.

Dear Sir,—I feel inclined to scribble a little this evening, and if in your judgment, any of your readers will take the trouble to read this letter, publish it; if not, burn it. After leaving Philadelphia and arriving at the Schuylkill, a distance of 4 miles, the railroad is carried over a neat bridge, and the cars drawn up an inclined plane by a stationary engine, one hundred and eighty-four feet; although few accidents have happened, travellers seldom ride up, as, should the rope break, certain death, and that of the most awful kind, would be the result. It is contemplated to carry the entrance into the city by some other direction, which will, 'tis said, avoid the necessity of a plane, and which will add exceedingly to the transportation; after ascending the plane locomotives are attached to the cars, and passengers and merchandise are hurled along with the usual rapidity that these "*terrible criters*" (as my Kentucky friend calls them,) travel. The road belongs to the State, and also the engines, for which a regular charge is made to proprietors of cars and merchandise. They have not as yet given much attention to transporting animals, except hogs, and *they* are brought down in great numbers, and with profit to the drovers, as they accomplish but a few miles per day when driven, and loose considerable in weight—this road already reaches to Columbia on the Susquehannah, passing directly through the flourishing town of Lancaster. It has however reduced the price of lands in the vicinity of Philadelphia, and increased the price in the interior; a farm which 3 years since cost $130 per acre, 6 miles from Philadelphia, and which has been much improved, sold a few days since at $94. Many anecdotes are related of some of the Dutch farmers that opposed the road. One was asked for his reason, when he was at the same time told it would pass through his farm, and enhance the value very much. "Vy when dey brake one of dere rails dey will go and tak one from my fense." Another said chestnut timber was then scarce, but to build a road to Pittsburgh of rails it would take all that was in the country. But with all that is said in ridicule of them, they show many evident good results from their cautious system of farming. Nature has done much for those located in the valleys of Cheshire, Lancaster and York counties, as to the quality of their soil The landscape also through those counties is not equalled in this country, and if they had hedges where they had post and rail fence, it would exceed any that I ever saw, even in old England. Their barns surpass those of any other country on earth, and the free use of whitewash on the outbuildings and fences have a beautiful contrast with the luxuriant clover fields.—I regretted being hurled along so rapidly when there was so much to see, but after staying a day at this place, I shall proceed more at my leisure. I will close this letter by giving you a description of one of these Dutch farms, by a quotation from Washington Irving's description of one on the North River, for when you see one Dutch farm you see them all. "A great elm tree spread its branches over his residence, and near which bubbled a spring of the softest and sweetest water passing through the milkhouse, and then stealing away through the grass to a neighboring brook, that bubbled away through the alders and dwarf willows. Hard by the house was a vast barn, that might have served for a church, every window and crevice of which seemed bursting forth with the treasure of the farm; the flail was busily resounding within from morning till night, swallows and martins skimmed twittering about the eaves, and rows of pigeons, some with one eye turned up, as if watching the weather, some with their heads under their wings or buried in their bosoms, and others swelling and cooing and bowing about their dames, were enjoying the sunshine upon the roof. Sleek and unwieldly porkers were grunting in the repose and abundance of their pens, from whence sallied forth now and then troops of sucking pigs, as if to snuff the air—a stately squadron of snowy

geese were riding in an adjacent pond, convoying whole fleets of ducks—regiments of turkeys were gobbling through the farm yard, and Guinea fowls fretting about it like illtempered housewives with their peevish discontented cry. Before the barn door strutted the gallant cock, that pattern of a husband, warrior, and a fine gentleman, clapped his burnished wings, and crowing in the pride and gladness of his heart, sometimes tearing up the earth with his feet, and then generously calling his ever hungry family of wives and children to enjoy the rich morsel he has discovered."

Yours, &c. B. P.

THE WEST.—Who can find a parallel for the growth of population and improvements in the west, not to mention the *far west*, within the United States and territories?—And who, that lives in the old settlements, will not feel some slight sensations, a little like shame, when they reflect on the evidences they can see every day, that in vast regions where twenty or even ten years ago, the foot of civilization had never left its print within hundreds of miles, there is now, not only organized and civilized society, but examples in improvement which the inhabitants of the more ancient States, appear, in too many instances, to lack the courage to follow. To illustrate the truth of this, nothing more is necessary than the following notices, given in the last page of the 4th number of the 'Indiana Aurora,' a new and valuable paper, published at Indianapolis, in the State of Indiana.

AGRICULTURAL FAIR.—The board of managers of the Marion County Agricultural Society, having determined to hold an Agricultural Fair, at Indianapolis, on the last Friday of October next, have made arrangements for awarding the premiums which follow: Fifty dollars of the amount necessary to meet the award, was generously appropriated by the board of justices of Marion county, and the residue has been made up by individual subscriptions.

The list of premiums which follows, embracing a most judicious selection of articles, amounts to $169.

N. B. Persons who propose competing for premiums, must first become members of the Society—*Ladies*, of course, always excepted.

But if the doings of a single county in this region, so lately a wilderness, should give astonishment to us, who boast of belonging to the first rank in the march of improvement in civilization, what will be thought of the following from the last number of the same paper?—Let us boast no more, but try to follow the example.

STATE AGRICULTURAL SOCIETY.

Agreeably to the provisions of the "Act for the encouragement of Agriculture," the State Agricultural Society of Indiana convened in the Hall of the House of Representatives.

The meeting was called to order by Mr. Blake, President of the State Board, and the list of Societies being called over, the following gentlemen appeared, presented their credentials, and took their seats:

JAMES BLAKE,
JOHN OWENS,
LARKIN SYMMES,
M. M. HENKLE,
N. B. PALMER,
} State Board.

Colonel D. L. McFarland, Marion County Agricultural Society.

Christian C Nave, Hendricks County Agricultural Society.

William R. Bennett, Union County Agricultural Society.

David Noble, Hancock County Agricultural Society.

William Dunn, Jefferson County Agricultural Society.

Captain John Busby, Fall Creek, Madison County Agricultural Society.

The following Societies having failed to send up delegates, gentlemen present, from these Societies, were invited to seats as honorary members of the Society, viz:

Rush, Washington, Wayne, Tippecanoe, Putnam, Knox, Monroe, Henry, Franklin, and Rising Sun, Dearborn county.

M. M. Henkle, Secretary of the State Board, then read to the meeting the following report from that Board:

REPORT OF THE INDIANA STATE BOARD OF AGRICULTURE.—Agreeably to the provisions of "An Act for the encouragement of Agriculture," this is the period designated for a meeting of the friends of Agriculture, representing the different sections of the State, for the purpose of "devising plans of operation, means for the diffusion of agricultural intelligence," and generally, to do whatever may be done in advancement of the grand object in which we have embarked. And though the Board are not required to make report to this meeting, but to the Legislature, yet, regarding this meeting as a grand council of agriculture, by the aid of whose united wisdom, the Board are to be the fitter prepared to make up their annual report to the Legislature, we can but regard it as our implied duty to present to this meeting a brief report of our proceedings, prospects and plans.

At this early period of our operations, under the late agricultural law, it is not to be expected that we should be prepared to present much in the nature of a history of what has been done in this cause, either by us or by the Societies but recently organized under the statute. This Board was not created until the latter part of April, and when organized, were wholly destitute of any means or resources for prosecuting a profitable correspondence, or of imparting information or advice, or of operating in any efficient manner upon the agricultural community of the State. They have, however, not been wholly inactive. Immediately after their organization, they prepared, printed and circulated throughout the State, a circular, giving such advice and directions as they thought calculated to facilitate the formation and efficient and harmonious action of county Agricultural Societies. And they have been greatly gratified to observe the spirit and zeal with which the citizens of many of the counties have formed Societies and carried forward their operations. In a considerable number of counties, agricultural fairs have been held; and in each particular instance, they are represented as having excited the liveliest interest, and produced the best effects.

In some counties, however, nothing has been done,—in others, Societies have been formed, but have not persevered in the good work sufficiently to exite a suitable interest, or to produce any permanently beneficial results. The Board ask the aid and direction of this meeting in devising means which shall create a deeper and more universal interest in this matter than has heretofore existed.

The Board, on their organization, authorised the Secretary to open a correspondence with distinguished scientific agriculturalists in different parts, for the purpose of collecting intelligence which would be of value to us in carrying on the work in which we have engaged. This has been done to some extent, and extracts will be read to the Society; but it was not to be expected that persons serving on this Board without compensation, could incur much expense in carrying on a correspondence, however beneficial it could not have failed to be, if properly conducted.

The Board were early led to reflect upon the great importance of collecting an agricultural library, knowing the great scarcity of works of this sort in our new country; their immense value in exciting to effort, and in giving intelligent direction to that effort. And a subscription was prepared for receiving donations for this object. Little, however, has as yet been done. Three of the members of the Board have contributed to that object, each ten dollars, and two gentlemen of Owen county have each contributed two dollars and fifty cents.

The Secretary has also received from Judge Buel, the enterprising President of the New-York State Agricultural Society, and editor of the Cultivator, a complete file of his valuable periodical, as a donation to our library. Mr. Medary, editor of the Ohio Farmer, and Dr. Wallace, editor of the Farmer and Mechanic, have each generously presented copies of their respective periodicals, for the same purpose.

The grand subjects, to which, in the opinion of the Board, we should look, (either presently or prospectively, according to our means,) for the accomplishment of our ulterior design, are, 1. The organization and keeping in active life, of county and township Agricultural Societies. 2. An Agricultural Library. 3. A periodical suited to our Agricultural condition, and calculated for our meridian. 4. An experimental farm and gardens, thro' which to introduce to the notice of our farmers, the best varieties of animals, vegetables and products, and the best method of cultivating, improving and perfecting them. 5. A school, in which agriculture shall be taught scientifically and practically, and by which this, the most ancient, honorable, and useful vocation, shall be elevated

to that high ground it deserves to occupy in science and literature, in respectability and usefulness.

The Board are by no means discouraged on account of the LITTLE that has yet been done, but are rather encouraged by the promise and prosperity which have attended our incipient operation.

We have been more successful in our early experiment, than any State in the Union, so far as our knowledge extends.

Where fifteen or twenty years since, were the battle fields and hunting grounds of the red archer, we have witnessed the peaceful tumults of the agricultural fair, —the kindly rivalry of domestic and mechanic competition.

Ours must ever be an agricultural State—must be almost exclusively so—may be pre-eminently so; and already our recent wilderness begins to bloom as the rose, and our agricultural tree to spread itself abroad as the cedars of Lebanon.

Diligence, zeal and perseverance in this good cause, will make us the humble benefactors of our State, and of generations which shall come after us. On this field we may rear us monuments, more to be valued than sculptured marble or ever-during brass—may win bloodless laurels, which shall bloom in living green over our unlettered tombs, when those of the sanguinary hero and titled oppressor of mankind shall have faded and withered, and their names cursed and forgotten.

JAMES BLAKE,
JOHN OWENS,
LARKIN SIMMES,
M. M. HENKLE,
N. B. PALMER,
} State Board.

December 14th, 1835.

After the reading of the Report,

Richard L. Thompson, of the House of Representatives, offered the following resolution, which he supported in an eloquent address:

Resolved. That the Report of the State Board be adopted and printed in the newspapers of this place; and that the Board be requested to continue their efforts for the promotion of the interests of Agriculture in this State.

The resolution was unanimously adopted.

C. B. Smith, Speaker of the House of Representatives, offered the following resolution, and in some pertinent and able remarks, supported its object:

Resolved, That a committee of two be appointed to inquire into the necessity, advantages, cost and probability of support, of a monthly agricultural periodical, of not larger than super royal size, and report to the State Board.

C. Fletcher proposed to amend the resolution by adding, in its proper place, "or of inquiring into the practicability of engaging the proprietor of some weekly newspaper in this State to devote such paper the coming year to agricultural science and intelligence."

Mr. F. accompanied his amendment with some appropriate remarks on the general utility of agricultural papers, and the great and present necessity of such a work in our State, as an indispensable auxiliary to the general system of Agricultural Improvement lately commenced in Indiana. The amendment, and then the resolution as amended, were adopted.

Hon. J. L. Holman, Judge of the United States District Court, offered the following resolution, and in support of its object, made an able and very interesting address:

Resolved, That the State Board be instructed to inquire into the propriety of memorializing the Legislature on the subject of establishing a school in which the science and practice of agriculture shall be taught, and of connecting the same with some of our schools and colleges, and that they embody the result of their inquiries in their annual report, or lay the subject before the Legislature, as they may deem expedient.

To which, on motion of John Dumont, of the Senate, the following amendment was appended, and thus amended, was adopted: "and that they inquire whether it is probable that the Beaver could be so far domesticated as to be profitable to those who should embark in such undertaking."

Mr. Dumont read an article of considerable length and interest in support of his amendment.

Mr. Henkle read an interesting letter from Hon. Jesse Buel, of Albany, N. Y., on the subject of agricultural schools.

David Macy, of the House of Representatives, offered the following resolution, which was adopted:

Resolved, That in the opinion of this meeting, it is highly important to the agricultural interests of this State, to have, at the seat of government, an Agricultural Library, for the use and benefit of agriculturalists generally, and for the delegates of county Societies, and the State Board especially; and that the State Board be instructed to ask the Legislature to appropriate a sum not less than fifty dollars, to be applied under the direction of the Board, to the purchase of suitable works on agriculture.

On motion of Col. D. L. McFarland, the following resolution was adopted:

Resolved, That the members of the State Agricultural Society be requested to appear in domestic apparel, at their next annual meeting.

The following resolutions were offered by Mr. Fletcher:

Resolved, That a committee of two members of the State Board be appointed to prepare a memorial to the present General Assembly, requesting that the "Act for the encouragement of Agriculture," be so amended as to make it the duty of the several Boards doing county business, to appoint one of the three nominees, who may be annually presented by the Agricultural Societies of the respective counties, as the delegate to the State Society; and should there not be an Agricultural Society in any county, the Board doing county business in such county, shall appoint a suitable individual as such delegate, making such compensation for his time and services, as may be deemed proper.

Resolved, That, in order to perpetuate the history of the progress of agricultural science and practice in Indiana,—to afford proper information to the State Society in its operations, and to connect this great interest with the policy of the State, that they farther ask an amendment of said act, so that each Board doing county business, obtain from their respective Agricultural Societies, or otherwise, and record upon the books of the Board, an annual statistical account of the growth of staple articles of husbandry, and manufactures, in each county.

After some discussion, in which Mr. Fletcher, Col. Berkshire, Judge Dunn, and Mr. Kilgore, of the House of Representatives, took part, the resolutions were adopted.

On motion of M. M. Henkle, it was

Resolved, That a committee of two be appointed to inquire into the best means and probable advantages of introducing into our State improved breeds of cattle, and other domestic animals, and report to the State Board.

On motion of Mr. Fletcher, it was

Resolved, That a committee be appointed to inquire into the propriety of encourageing the growth and manufacture of silk in this State, and report to the next annual meeting, or to the State Board.

Resolved, That a committee of two be appointed to ascertain the quantity of cotton and tobacco raised in this State, and whether our climate, soil and prospects of a market, will justify a competition with other States in the growing of both or either of those articles, and make report to the next annual meeting.

The Society then adjourned sine die.

JAMES BLAKE, President.

M. M. HENKLE, Secretary.

For the Railroad Journal.

ON THE MANUFACTURE AND USE OF SOLUBLE GLASS.

Translated from "Traité de Chimie appliquée aux Arts, par Mr. Dumas," by JAMES RENWICK, L. L. D., Prof. of Nat Exp. Philosophy and Chemistry in Columbia College, New-York.

Soluble glass is a simple silicate of potassa or soda, which unites perfect solubility in boiling water to some of the general properties of common glass: besides, although the uses to which soluble glass is applied are very different from those of common glass, the study of it will furnish such exact and close analogies to other descriptions of glass, that we are compelled to include it in the groupe of chemical compounds which they form.

The discovery of soluble glass and of its uses, is due to a distinguished German chemist, from whom we derive all we have to say in relation to it. This glass, when dissolved in water, forms a liquid which may be applied to cloth or wood, for the purpose of rendering them incombustible. In fact, by the evaporation of the water in which it is dissolved, a layer of a substance capable of fusing when heated, is deposited

on these bodies, which is capable of protecting them from the contact of air necessary for their combustion.

Preparation.—Soluble glass may be obtained by dissolving pure silea, obtained by precipitation, in a boiling solution of caustic potassa; but, this process being both inconvenient and costly, cannot be practised upon a large scale.

When sand and carbonate of potassa are heated together, the carbonic acid is never wholly driven off, except when the sand is in excess; but the whole of the carbonic acid may be expelled by adding powdered charcoal to the mixture, in such proportion that the carbonic acid of that part of the carbonate which is not decomposed may meet with a sufficient quantity of carbon to convert it into carbonic oxide. In this way the silica first forms a silicate in the proportions contained in common glass, and drives off the appropriate equivalent of carbonic acid; then, at a high heat the rest of the carbonate of potassa is decomposed by the carbon, the carbonic oxide escapes, and the potassa thus freed, either sublimes, or combines with the glass already formed.

In order to obtain soluble glass of good and uniform quality, certain precautions are necessary. The carbonate of potassa employed, must be purified.* If it contain much chloride of potassium, the product will not be entirely soluble in water, and a glutinous residuum will be left. In addition, the glass will be liable to effloresce. Sulphate of potassa does not produce any bad effect, because it is decomposed by the carbon, when the matter continues sufficiently long in fusion, but without this precaution the glass will contain sulphuret of potassium, which also has a tendency to effloresence.

The sand must be pure, or at any rate must not contain any notable proportion of lime or alumina, for these earths render a part of the glass insoluble. A small portion of oxide of iron has no influence on the qualities of the glass.

The sand and carbonate of potassa (pearlash) are taken in the proportion of two of the latter to three of the former, and to 10 parts of pearlash and 15 of sand, 4 parts of charcoal are added; a less portion of charcoal must not be taken; on the contrary, if the form of potash employed be not sufficiently pure, a larger proportion of charcoal may be advantageously employed. This substance accelerates the fusion of the glass, and separates from it all the carbonic acid, of which there would otherwise remain a small quantity, which would have an injurious effect.

In other respects, the same precautions that are employed in the manufacture of common glass, are to be observed. The materials must be first well mixed, then fritted, and finally melted in a glass pot, until the mass becomes liquid and homogeneous. The melted matter is taken out of the pot with an iron ladle, and the pot is then filled with fresh *frit*.

Thirty pounds of pearlash, 45 of sand, and 12 lbs. of powdered charcoal may be taken for a charge; with this quantity the heat must be continued for 5 or 6 hours.

* Pearlash being the purer form, we shall use its name in the practical part.

The crude glass thus obtained is usually full of air bubbles; it is as hard as common glass, of a blackish gray color, and transparent at the edges; sometimes it has a color approaching to whiteness, and at others is yellowish or reddish; these are indications that the quantity of charcoal has not been sufficient.

If it be exposed for some weeks to the air, it undergoes slight changes, which rather tend to improve, than injure its qualities. It attracts a little moisture from the air which slowly penetrates its mass, without changing its aggregation or its appearance; it merely cracks, and a slight effloresence appears at its surface. If it be exposed to heat, after it have undergone this change, it swells up, owing to the escape of the aqueous matter it has absorbed.

In order to prepare it for solution in boiling water, it must be reduced to powder by stampers; if this were not done, it would dissolve too slowly. One part of glass requires from 4 to 5 of water for its solution.

The water is first heated to ebullition in an open boiler, the powdered glass is then added by degrees, and must be continually stirred, to prevent it from adhering to the bottom. The ebullition must be continued three or four hours, until no more glass is dissolved: the liquor will then have acquired the proper degree of concentration. If the ebullition be checked before this state is attained, carbonic acid will be absorbed by the potassa from the air, which will produce an injurious effect; for the same reason, too great a quantity of water must not be employed, for during the long evaporation which will then become necessary, the carbonic acid of the water will readily combine with the potassa, and cause a precipitation of the silica.

When the liquor becomes too thick, before the whole of the glass is dissolved, boiling water must be added.

When the solution has acquired the consistence of syrop, and a density of 1.24 to 1.25, it is sufficiently concentrated and fit for use. It is then permitted to rest, in order that the insoluble parts may be deposited; while it is cooling, a coriaceous pellicle forms upon the surface, which after a time disappears of itself, or may be redissolved by depressing it in the liquor. This pellicle begins to appear during the ebullition, as the liquor approaches a state of concentration, and may even serve to indicate this state.

When the crude glass is of a proper composition, contains but few saline impurities, and no sulphuret of potassium, it may be treated in the way we have described. But if it contain any notable proportion of these substances, they must be separated before it is dissolved; this separation may be effected in the following manner. The powdered glass is exposed to the action of the air for three or four weeks, during which time it must be frequently stirred; if it run into lumps, which will happen in moist weather, they must be broken up. The glass, as we have stated, attracts moisture from the air, and the foreign substances either separate or effloresce. It then becomes easy to remove them from the glass. It is sprinkled with water, and frequently stirred. At the end of three hours the liquor is removed, it will then contain a part of all the saline impurities, and a little of the silicate of potassa; the powder is again to be washed with fresh water. Soluble glass thus treated, readily dissolves in boiling water, and the solution leaves nothing to be desired.

As soluble glass is employed in the liquid form alone, it is kept in this state for use. To preserve it, no particular care is necessary, as even after a long space of time it undergoes no perceptible change, if the solution have been properly prepared. The only precaution is not to allow air too free an access to it.

A similar product may be obtained by using a carbonate of soda instead of one of potassa. In this case, two parts of the soda of the shops is required for one of silica. This glass has the same properties as the other, but is more valuable in its uses. The solutions of these two kinds of glass may be mixed in any proportion whatever, and this mixture is more serviceable in some cases, than either of them separately.

Properties.—Soluble glass forms a viscid solution, which when concentrated becomes turbid and opalescent; it has an alkaline taste and reaction. The solution mixes in all proportions with water. When the density of the solution is 1.25, it contains nearly 28 per cent. of glass; if the concentration be carried beyond this point, it becomes so viscid that it may be drawn out in threads like molten glass. Finally the liquor passes to the state of a vitrous mass, whose fracture is conchoidal; it then resembles common glass, except in hardness. When the solution is applied to other bodies, it dries rapidly at common temperatures, and forms a coat like a varnish.

Soluble glass when dried, does not undergo any perceptible change when exposed to the air, and attracts from it neither moisture nor carbonic acid; neither has the carbonic acid of the atmosphere any well marked action on the concentrated solution; but when a current of carbonic acid is passed through the solution, the glass is decomposed, and hydrate of silica deposited. But a weak solution becomes turbid on exposure to the air, and is after a time decomposed wholly. When the glass is impure, an effloresence is formed after a while, which may be produced either by the carbonate and hyposulphite of potassa, or by chloride of potassium.

Soluble glass dissolves gradually without residuum in boiling water; but in cold water the solution is so slow as to have led to a belief that it does not dissolve at all. It however never becomes entirely insoluble, except when it contains a much larger proportion of silica, or when it is mixed with other bodies, such as the earths, metallic oxides, &c. with which double or triple salts are formed, as is the case in the common glasses.

Soluble glass which has been exposed to the air, and is afterwards submitted to the action of heat, swells and cracks at first, and melts with difficulty. It then loses about 12 per cent. of its weight. It therefore contains, even when solid, a consider-

able quantity of water, which it does not lose when simply dried by exposure to the air.

Alcohol precipitates it unaltered from its solution in water. When the solution is concentrated, but little alcohol is required for precipitation, and it need not be highly rectified. Pure soluble glass may therefore be easily obtained from an impure solution by the use of alcohol. The alcohol being added, the gelatinous precipitate is permitted to settle; the supernatant liquor is decanted, the precipitate collected, rapidly stirred after the addition of a little cold water, and subjected to pressure. In truth, however, this process is attended with some loss, for even cold water will rapidly dissolve the precipitated glass, in consequence of its minute division.

The acids decompose the solution of glass. They also act upon it when solid, separating the silica in the form of powder.

Uses.—The properties of soluble glass fit it for numerous and varied applications. It has been used in the theatre of Munich as a means of safety from fire.

All sorts of vegetable matter, wood, cotton, hemp, linen, paper, &c. are, as is well known, combustible, but in order that they shall burn, two conditions are requisite, an elevated temperature, and free contact of air, to furnish the oxygen necessary for their transformation into water and carbonic acid. When once set on fire, their own combustion develops the heat necessary to keep up the chemical action, provided they be in contact with air. If deprived of such contact, and made red hot, they will, it is true, yield inflammable volatile products, but the carbon which is left will not burn, as it is deprived of air, and thus the combustion will stop of itself. Such is the part which all the fixed fusible salts are capable of performing, if they be in addition composed of substances incapable of yielding their oxygen at a low red heat, to either carbon or hydrogen. These salts melt as the vegetable matter becomes heated; they form upon it a coat impenetrable to the air, and either prevent altogether, or limit its combustion. The phosphate and borate of ammonia have such a character, but they are so readily soluble in cold water, as to be liable to objections which cannot be urged against soluble glass.

Although soluble glass is of itself a good perservative from fire, it fulfills the object better when it is mixed with another incombustible body in powder. In this case the solution of glass acts in the same manner as the oil of painters. The several coats have more body, become more solid, and more durable, and if the substance which is added be of proper quality, coagulate by the action of fire into a strongly adhesive crust. Clay, whiting, calcined bones, powdered glass, &c. may all be employed for this purpose; but we cannot yet say with certainty which of them is to be preferred. A mixture of clay and whiting, appears to be better than either used separately. Calcined bones form with soluble glass a very solid and adhesive mass. Litharge, which, with the glass, makes an easily fusible mixture, does not give a product fitted for coating wood, as the mixture contracts in drying; it therefore cracks, and is easily separated. Flint glass, and crude soluble glass, are excellent additions. The latter ought to be exposed to the air after it is pulverized, in order to attract moisture.—If it be mixed with the solution, and be then applied to any body whatever, it in a short time forms a coating as hard as stone, which if the glass be of good quality, is unalterable by exposure, and resists fire admirably.

The scoriæ of iron and lead, felspar, fluor, may all be employed with soluble glass; but experience alone can decide which of these substances is best, and in what proportion they are to be employed. We should advise that the first coat should always be a simple solution of the glass; and that a similar solution be applied over coats composed of its mixture with other substances, particularly when such a coat is uneven, and rough.

The last named substances form a solid and durable coating, which suffers no change by exposure to the air, does not involve any great expense, and is readily applied. But in order that it may not fail, particular care is to be taken both in preparing and employing it.

In order to cover wood and other bodies with it, the solution must be made of a pure glass, for otherwise it would effloresce and finally fall off. However, a small degree of impurity is not injurious, although after a few days a slight efflorescence will appear; this may be washed off by water, and will not show itself a second time.—When a durable covering is to be applied to wood, too strong a solution must not be employed at first, for in this case it will not be absorbed, will not displace the air from the pores, and in consequence will not adhere strongly. It is a good plan to rub the brush several times over the same place, and not to spread the coating too lightly. For the last coats a more concentrated solution may be employed, still it must not be too thick, and must be spread as evenly as possible. Each coat must be thoroughly dry before another is applied; and this will take in warm and dry weather at least 24 hours. After 2 hours the coat appears to be dry, but is still in a state to be softened by laying on another. The same inconvenience will then arise, which occurs when a thick coat of a concentrated solution is applied; the coast will crack, and does not adhere. This however is only the case when potassa is the base of the glass, for that formed from soda does not appear to crack.

In applying soluble glass to the woodwork of the theatre at Munich, 10 per cent. of yellow clay (*ochre* ?) was added. After six months, the coat had suffered but little change; it was damaged only in a few places, where it had need of some repair. This arose from a short time only having been allowed for the preparation and application of the glass, and they were therefore done without proper attention.

When this mode is employed for preserving a theatre from fire, it is not enough to cover the woodwork, it is also necessary to preserve the scenery, which is still more exposed to danger. None of the methods yet proposed for this purpose appears as advantageous as soluble glass, for it does not act on vegetable matter, and completely fills up the spaces between the thread; it fixes itself in the web, in such a way that it cannot be separated, and increases the durability of the fabric. The firmness which it gives to stuffs does not injure them for use as curtains, because it does not prevent them from being easily rolled. So far as the painting of scenes is concerned, the glass forms a good ground for the colors. To prevent the changes which some colors, Prussian blue and lake for instance, might undergo from the alkaline matter, it will be necessary before painting to apply a coat of alum, and then one of whiting.

There is no great difficulty in applying soluble glass to cloths, still this operation is not so easy as might at first be imagined. It is not sufficient to coat or dip them in the solution; they still require after this operation to be subjected to pressure. This object might perhaps be best attained by passing them between rollers plunged in the solution. When a cloth which is only coated with soluble glass, is put into the fire, it will remain incandescent after it is taken out. This is not the case when it has been properly impregnated with the solution. A still better purpose is answered in this case, when litharge has been added to the solution. The stuff in drying yields to the shrinking of the mixture, and becomes inseparable from it, which is the reverse of what happens when it is applied to wood. A single part of litharge in fine powder is sufficient for 14 parts of concentrated liquor.

Soluble glass is capable of many other applications, and particularly as a cement; for this use it is superior to all those which have hitherto been employed, for uniting broken glass, porcelain, &c.

It may be used in place of glue or isinglass in applying colors, although when employed by itself, it does not make a varnish which will preserve its transparency when in contact with air.

AGRICULTURE.

Agriculture, whether considered in reference to health, pleasure, moral influence, security, independence or respectability, will not suffer in comparison with any other employment in which mankind are engaged; and indeed, in most of these respects it claims a decided premiuence over every other pursuit. Nothing is so well fitted to strengthen and invigorate the frame and constitution, as exercise in the open air, or better calculated to avoid the inception or prevent and restrain the ravages of disease, than the hardiness induced by agricultural labors. The farmer is assailed by fewer temptations to vicious indulgence, than the laborers in other occupations, and the nature and variety of his engagements, while they are productive of mental quietude and enjoyment, directly tend to teach him to "look through nature up to nature's God." Furnishing sustenance and the materials on which their industry is exerted, to the manufacturing and commercial classes, he seems to originate every thing, and is in truth, as independent of his fellows, as in civilized society it is possible for any individual, composing the general aggregate, to be.—[N. H. Patriot.]

HUNTER'S STONE-PLANING MACHINE.

Fig. 1.

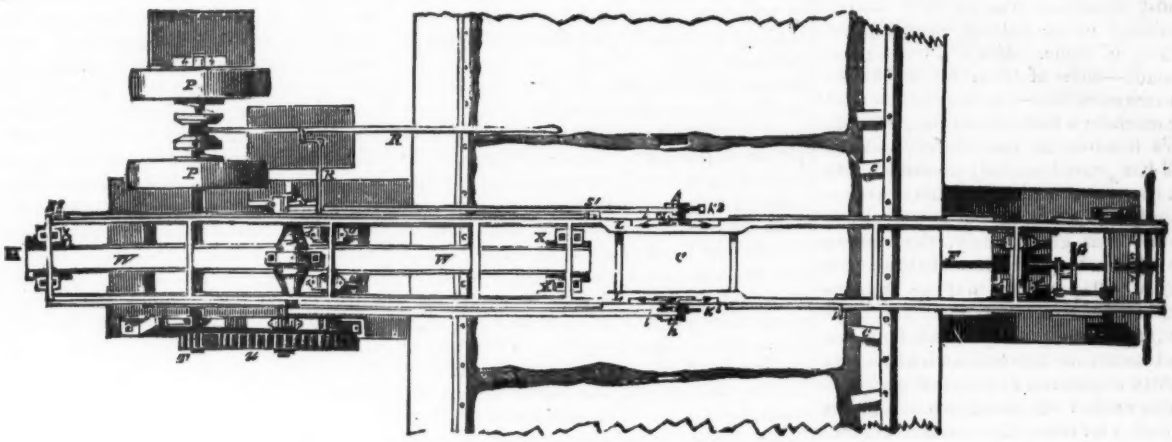
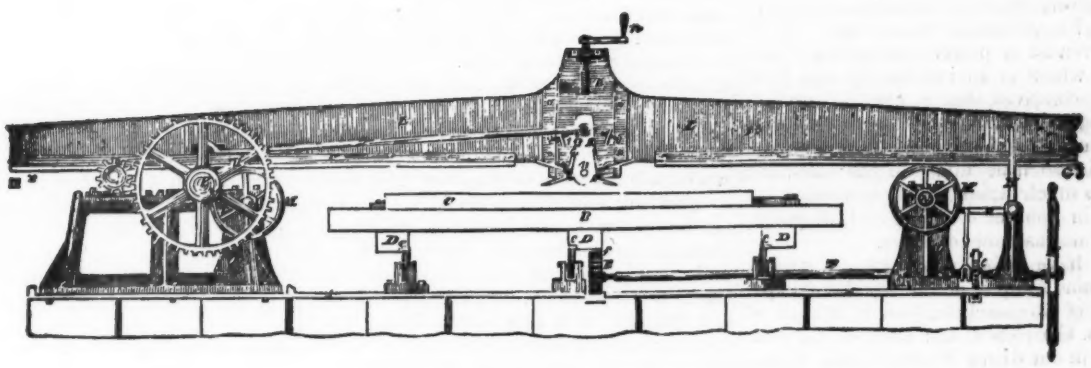


Fig. 2.



ELEVATION.

Fig. 3.

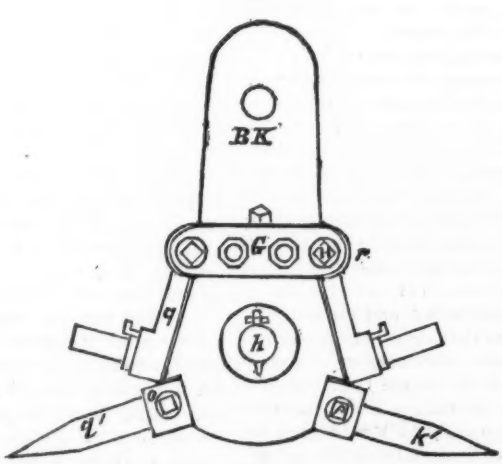
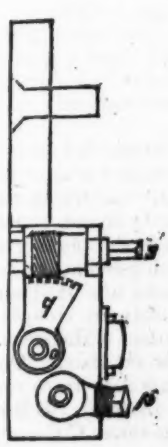


Fig. 4.



From the London Mechanics' Magazine.

HUNTER'S STONE-PLANING MACHINE

Among the few exceptions to the universality of steam-power as a first mover, which existed a year or two ago, by far the most important was its very limited applicability to the cutting, dressing, and fashioning of stone. Many attempts had been made—some of them by machinists of first-rate eminence— to construct a steam-power machine which should supersede the mason's hand-mallet and chisel; but one and all had proved entirely abortive. Difficulty there was none in contriving steam-machinery that would slice or hew in pieces, and even with great nicety, the stoutest blocks which the quarry could furnish; but the difficulty lay in this, that the immense friction to which metal points or edges are subject, when brought with great force and in rapid succession into contact with so hard and gritty a material as stone of every description, caused so prodigious a waste in tools, that it far more than counterbalanced any advantage that could result from superior celerity of execution.

The merit of overcoming this serious objection, and of adding thus one more to the triumphs of the steam-engine, belongs to Mr. James Hunter, the Superintendent of the Leysmill Quarries, near Arbroath. After several years of thinking and contriving, and experiments without number, he has invented a power stone-planing machine, which is so ingeniously and judiciously contrived, that it cuts and dresses the largest blocks of stone not only with as much exactness as can be done by hand, but with so little injury to the tools, and with so much rapidity, as to leave all hand labor, in point of economy and despatch, at an immeasurable distance.

We have before presented our readers with some samples of the wonderful capabilities of this machine, (see the Report of Messrs. Carmichael and Kerr, C. E., published in our 612th Number,) and we are glad to have it now in our power to lay before them the first description which has appeared of the machine itself, to which we shall add some additional information of great interest which we have been favored with by the patentee respecting its performances.

The engraving (fig. 1) on our front page represents a plan of the machine as it appears in its complete state when fixed and ready for working, to a stone bed or foundation; and fig. 2 is an end elevation thereof. The steam-engine employed is omitted in both views.

The machine, of which AA is the sole or foundation plate, consists of three principal parts; *first*, a platform, which carries the stones to be planed; *second*, two tilt or cant blocks, which hold the planing tools; and, *third*, a traversing-frame, in which these tilt or cant blocks are fixed, and by means of which the tools are brought into action against the surface of the stone.

1. The *platform for the stones*. On the sole or foundation-plate AA, three rows of traverse-rollers *a a a* are fixed. B B is the platform on which the stones C C are laid; it moves to and fro on the rollers *a a*, and is formed of planks, four inches thick, laid across three longitudinal beams D D, and securely bolted thereto. The two parallel bars *b b* nailed to the surface of this platform are about an inch thick, and faced with plate-iron; they serve as ledges within which to secure and steady the stones C C, by means of loose chocks of wood of different sizes. Where the longitudinal beams D D D of the platform rest or bear on the traverse-rollers *a a a*, they are strengthened to meet the extra pressure by under-plates of iron *e e e*. To the bottom of the central beam a toothed rack *f* is fixed, which extends from end to end.

2. *The cant or tool blocks*. BK, BK, are two blocks fixed into the traversing-frame, one on each side, with two tools i^1 i, k^1 k, in each. Fig. 3 is a front view and fig. 4 a side view, of these cant-blocks, on a larger scale than in figs. 1 and 2. They turn on studs *h h*, which are fixed in vertical sliding-blocks *m m*, which are moveable up and down by the screws and handles *n n*, so as to be adjustible to any thickness of stone that may be required to be cut. The two tools marked *i* and k^1 are roughing tools, and those marked i^1 and *k* are finishing tools. All are of a round form, and about an inch in diameter; the two finishing ones have chisel or broad mouths. Both sets of tools are fixed in wrought-iron tubes *o o* by means of adjusting screws *p p*, which tubes are turned so as to fit accurately into holes bored in the cant-blocks B K. To each set of tubes in which the finishing tools are fixed a short lever *q* is keyed on, the upper end of which is slightly curved and toothed, and above it there is a horizontal screw *r*, which works into the teeth of this lever *q*, so that by applying a spanner to the square head *s* of the screw *r*, the finishing tool may, through the medium of the screw, the lever, and the tube, be adapted with the greatest nicety to the surface of the stone to be planed and dressed. No such nice adaptation is necessary in the case of the roughing tools, and to them, therefore, no such adapting lever is applied. G, fig. 3, is the cover for the pivots of the screw *r*. Two brackets are affixed to the face of the vertical sliding-blocks *m m*, in the manner represented in fig. 1, and two screws, *t* and *u*, are inserted therein, which screws serve to limit the arc described by the cant-blocks B K, B K, in turning on the studs *h h*, as afterwards more particularly explained.

3. The *traversing-tool frame*. L L is a large sliding frame, in the centre of which the working or planing tools are fixed, and which has a space of about six feet to traverse in, three on each side of the position in which it is represented in the engravings. This frame rests on four wheels or friction-rollers M M M M, affixed to the shafts N N, which revolve in brackets O O O O. P P are two pulleys, which revolve on an axis fixed in the standards G G, one of which is worked by an open strap, and the other by a cross strap, so that they may revolve in opposite directions, and thus give a reciprocating motion to the frame L L. Q is a clutch between the pulleys P P, connected with the handle and crank R R, which are acted upon by studs or catches S^1 and S, projecting from the sides of the sliding tool-frame L L in such manner as to make the clutch operate on each tool alternately. T is a pinion fixed to the end of the axis of the pulleys P P. U, a spur-wheel, into which the pinion T works, V the axis of this spur-wheel, on which axis there is fixed a pinion (not seen in the engravings), which works into a sliding-rack W W, the teeth of which point downwards. X X X X are the bearings on which the rack W W slides. Y Y is a strong beam fixed across the back of the rack W W, the ends of which project through the sides of the sliding-tool frame L L. Z Z are two connecting-rods, which pass from the ends of the beam Y Y to the blocks in which the planing-tools are fixed, as before explained. E is a pinion, which works in the toothed rack *f* on the under side of the central longitudinal beam of the platform B. F is a shaft, to one end of which the pinion E is fixed. G is a ratchet-wheel, near to the opposite end of the shaft E. H H is a pall and crank attached to a cross shaft, supported by the standards *l l*, which acts on the ratchet-wheel G. I is a pin, fixed in the side of the traversing-frame L L, and which, as that frame moves towards the side G*z*, catches the upright arm of the crank H, and presses it forward in that direction. K is a wheel, which, operating through the intervention of the shaft F, pinion E, and rack *f* on the platform B, throws it entirely back when all the stones upon it have been planed, or returns it under the planing tools if any part of the work requires to be gone twice over.

The *mode of operation* requires but little additional explanation. The platform being filled with blocks of stone, the vertical blocks *m m* are so adjusted that the roughing tools shall strike each block of stone as it passes under them, at such a depth below the top surface, as to sever and throw off before them large portions of the stone at a time, taking care always that the depth shall be within such limits as that the line of least resistance shall terminate in the top surface of the stone, so that the fractures shall all tend in that direction. When this adjustment has been made, the sliding-frame L L is to be moved towards H *x*, and as it traverses in that direction the sliding-rack W W carries the cross-beam Y Y in the same direction, until the connecting-rods Z Z have drawn the cant-blocks over as far as the screw *t*, when the roughing tools *i* and k^1 will be brought into operation against the stone, and so continue till the projecting stud or catch S comes in contact with the crank R, and throws the clutch off the pulley then in operation on to the other pulley, which will make the frame return in the opposite direction G*z*. The sliding-rack W W carries back at the same time the cross beam Y Y, till the connecting-rods Z Z push the cant-blocks over against the screw *u*, when the tools i^1 and k^1 are brought into play, and so continue till the catch S comes in contact with the crank, and again reverses the motion. At the moment of this last reversal of the motion taking place, the projecting pin I also throws over the upright arm of the pall and crank H H (in a manner similar to the yard-beam of a power-loom), and brings forward the platform B with the stones for

the next operation of the planing tools. The pall and crank H H falls back of its own weight into its former position, as soon as the pin I recedes from it. When the roughing tools are first brought into action, through the traversing of the frame L L towards H *x*, they commonly leave the surface of the stones in ridges, but the finishing tools being farther back, take off these ridges when returning, and so on till the planing of the blocks is completed.

No time is lost in clearing the platform of the finished blocks, as the men in attendance on the machine are removing the blocks at one end while the machine is at work at the other, and a minute or two suffices to return the platform. The frame L L generally traverses at the rate of 30 feet per minute, and a set of stones filling the platform from end to end, can be planed in about 45 minutes. As each tool wears it can be readily removed for the purpose of being repaired, or replaced by new tools by loosening the adjustings-crews *p p*.

The master feature of the invention appears to us to consist in the means provided for so adjusting the roughing tools (which have the roughest part of the work to perform), that they shall strike the blocks of stone as they pass under them, not *upon* the surface, as usual, but at *such a depth below it*, that the surface is driven off in large portions at a time. Not only are two or three tools thus able to do the work of a great many,* but the tools have time given them between each stroke to cool; or, to speak more properly, the strokes are made at such intervals that the tools never get sufficiently heated and softened to lose their original tempering. And hence this somewhat paradoxical consequence, that *the greater the thickness of surface which the tools have to cut away, the greater will be their efficiency, and the less they will be injured*; for the lengths of stone driven off at each stroke will always be proportional to the depth of the cutting, and the rest given to the tools in exactly the same ratio. We are informed that, in point of fact, the wear of iron is less by one-half in taking off two inches at a time than in taking off half an inch.

Another valuable though subordinate feature of the apparatus, is the ingenious manner of securing the tools in their places —the union of absolute fixedness while in operation, with the greatest facility for removing them as they are worn out and required to be repaired or replaced. The shaking or recoil after each stroke of the tools is stated to be so small, as to be hardly perceptible to the eye.

An important consequence of the equability of the force applied to the tools is, that the facing given to the stones by this machine is much smoother and sounder than any facing which can be given by the mallet and chisel. The surface of hand-wrought stones is always so bruised, or, what is technically called *dazed*, to a certain depth through the unavoidable varieties of strength and direction with which the chisel is applied, and this dazed portion has all to be rubbed off by the polisher before a sound face can be obtained. But in the case of the machine-planed stones, the surface is left in so nearly sound a state, that the labor and expense of after-polishing is reduced more than one half.

The stones, to the cutting and dressing of which this machine is advantageously applicable, must not, of course, be any of an exceedingly precious description—none of the rarer marbles for examples; but such as exist in so great abundance, that an inch more or less cut away from a surface is of no consequence, and such too as acquire their chief value from the labor bestowed on extracting them from the quarry, and dressing them for use. The sorts of stone to which the patentee considers it to be most applicable, are sandstones, limestones and freestones, in all their varieties.* The power and velocity requisite vary considerably, according as the stone is soft or hard. Thus, for example, the Arbroath, which is a sandstone of very close and firm grain, admits of a degree of speed many times greater than some of the softer sandstones; and requires a power just so many times less. Again, stone harder than the Arbroath would require both the strength of the machine and the power of the steam-engine to be proportionally increased.

During the last summer there were six of these machines at work in the Leysmill Quarries, which planed upwards of 170,000 feet of pavement. They are worked by one steam engine of 6 horse power, which has to work besides two inclined planes, up one of which the stones are dragged from the quarry to the machines.

We have before spoken of the Report of Messrs. Carmichael and Kerr, C. E., on the performances of these engines, and must here content ourselves with referring our readers to it for some very important and satisfactory details on this head. The attention of the Highland and Agricultural Society of Scotland having been drawn by one of its members to this Report, their Secretary was directed to request W. F. Lindsay Carnegie, Esq., the Proprietor of the Leysmill Quarries, to favor them with "a statement showing the comparative expense of machine-dressed stone and that dressed by hand." The following is an extract from Mr. Carnegie's answer to this application:—

"In the first place, looking at the Report of the engineers (Messrs Carmichael and Kerr), it will be seen that the wages of the people employed in dressing 4,400 feet, amounts to 6*l*. 15*s*. 6*d*.; this includes the wages of all employed in laying on, dressing, turning, and taking off the stones, and also the wages of a person employed in repairs and the construction of additional machinery. To the above may be added for coals 15*s*. (our local situation enhances this item considerably), and for interest of fixed capital, and wear and tear about 2*l*. The calculation will then stand thus:—

Wages	6*l*.	15	6
Coals	0	15	0
Interest	2	0	0
4,400 feet, at	9	10	6

about four-tenths of a penny per foot. It is more difficult to state what the exact cost of dressing the same stones by hand would amount to. I may say, however, with perfect safety of being within the mark, that the stones in question could not have been dressed by hand at less than four times the cost by the machine, and that this is rather below than above the ordinary rate of difference.

"It was purposely left to the engineers to take their choice of any of the machines as they found them in the ordinary course of working, no notice having been given to the men, nor any preparation made.—As it happened, the stones in hand came from one of the most indifferent strata of the quarry, and the results shown came proportionately below the usual average.

"Had it been thought desirable to show off the machine to the greatest advantage, it might easily have been done, and without the slightest deception, very different results might have been brought out.—Thus, on account of their great weight, large stones, such as landings, grave-stones, &c. are previously squared in the quarry; when laid on the level, therefore, they fill accurately all the space the machine traverses.

"Suppose such a stone, 12 feet long by 6 broad, and 8 1-2 inches thick, and that it were required (an ordinary case) to be reduced to 7 inches in thickness. I am quite safe in saying, that the machine will do this in forty minutes, leaving the surface so smooth, that 9*d*. in hand-labor would bring the 72 feet to a perfect polish.

"Estimating as above the cost of working four machines for sixty hours at 9*l*. 10*s*. 6*d*., forty minutes of one machine would amount to 6*d*., but say an hour or 9*d*. as the cost of hewing 72 feet by the machine, that is about one-eighth of a penny per foot.

"To bring the stone to the same state by hand, the mason would require to go over it with four operations. He would, to speak technically, 1st, 'dab it over rough with a puncheon;' 2d, 'broach it close with a puncheon;' 3d, 'scabble it with a chisel;' 4th, 'angle drove it for polishing.' In this state, in consequence of the bruising operation of his chisel on the face being greater than that by the machine, it would cost twice as much to polish it.—The cost of the above four operations, at the lowest estimate, would be 2 1-2*d*. per foot. Thus the cost of hewing by hand and by machinery, would, in this case, be as 20 to 1.

"In estimating the outlay by the machine, ample allowance is made for the handling of the stones, the chief expense in the wages of the extra people attached to the mill, while nothing is charged for the assistance the mason would undoubtedly require in setting up and moving this stone.

*In a stone-planing machine lately patented, the capabilities of which were much talked of for a time, there were no less than from 30 to 40 tools, to be applied in rapid succession to the stone.

*We are authorised by the patentee to state, that if any proprietor or lessee of a quarry, who may be desirous of trying the applicability of the machine to any particular species of stone, will forward a block of it in a rough state (carriage free) to Mr. Hunter (Leysmill, near Arbroath,) it will be returned to him planed and polished, along with an accurate report of the time occupied in the work, power applied, wear of tools, &c. Or, parties sending to Mr. Hunter two blocks capable of being turned into vases, according to patterns or drawings sent therewith, will receive in return one vase along with a report, &c. free of charge.

If this were taken into account, it would go far to double the comparative difference."

After receiving the above information, the Society thought the matter one of so much public importance, that they appointed a Special Committee of their number to repair to Leysmill, to "examine the machine in operation," and report the result of their personal examination. The Committee consisted of the following gentlemen:

Lord Panmure.
Mr. Carnegie, of Craigo.
Mr. Hawkins, of Dunnichen.
Mr. Millar, of Ballumbie.
Mr. Proctor, of Halkeston.

This Committee paid a visit to the quarries, accordingly, on the 29th of June last, and the following is their report to the Society:—

"With reference to the statements contained in a letter of date the 10th day of June current, from Mr. Lindsay Carnegie to the Secretary of your Society, your Committee are convinced that these statements are fully borne out, and beg to submit the result of their own observations—the following facts:—

"There were put upon the bed of the machine at the same time, three pavement-stones, in a rough state, and of unequal thicknesses, the first of which contained 12½ superficial feet, requiring to be reduced two inches in thickness; the second, containing 16½ superficial feet, requiring to be reduced three quarters of an inch; and the third, containing 18 superficial feet, and requiring to be reduced one inch and a quarter; the whole of which stone, amounting in all to 47 superficial feet, were reduced and polished in thirty minutes, including in this the time occupied in shifting the irons.

"Your Committee beg further to state, that with a view of comparing the working of the machine and hand labor, they interrogated Mr. Donald Mackay, master mason and builder, in Arbroath, who stated that to have accomplished the same work in the ordinary way by the hand, would have occupied a good mason five days and a half, at a cost of 15*s.* 9*d.*, according to the present rate of wages in this part of the country; whereas, according to calculations submitted by Mr. Lindsay Carnegie, and which your Committee have every reason to believe correct, the expense would amount to about 1*s.* 7*d.*

"In addition to the trial above noticed, your Committee saw stones, of the hardest quality, from different quarries in the country, dressed by the machine with a corresponding advantage; and your Committee cannot close this report without expressing their conviction of the great advantages to be derived from the extended operation of Mr. Hunter's machine, as being the means of preparing for the market as pavement, a quality of stone, which, without its assistance, could never be turned to account, as also the great saving to be obtained by its application to this hewing and dressing of all sorts of freestone.

"Your Committee beg leave also to report, that by the same steam-power they saw in operation the same principle applied as an experiment to a turning machine, from which they are satisfied that it may be applied with economy and advantage to the turning of stone vases, and other ornamental work."

"Leysmill, June 29, 1835."

The concluding passage of the preceding Report recalls to mind that we have yet one of the most valuable properties of this machine to notice—namely, that besides facing and dressing blocks of stone, it can be made (with the help of a lathe coupled to it) to turn, bore, and hollow them as well. Columns, ballisters, vases, drilled chairs and sleepers for railways, &c., may all, by this machine, be produced with a degree of accuracy, despatch and economy, wholly unattainable by hand labor. We mentioned in our notice of the last Meeting of the Institute of British Architects, (vol. xxiii., p. 349), one remarkable proof of this, which Mr. Carnegie presented to that Society, namely, a handsome vase turned out of the solid block, in the course of a single day's work, twenty inches high, and eighteen across the mouth. But this is nothing, we find, to what Mr. Hunter is making preparations to accomplish in the course of next winter's leisure. He talks with great confidence of being able to produce vases four feet high!—exact copies of our finest antiques, in all but the ornamental tracery, which must still remain to be done by hand. Of the ease with which holes might be drilled in stones by such combined machinery, the following extract from a letter, which we have seen from an eye-witness, furnishes equally striking evidence. He is describing a first trial in boring made by Mr. Hunter. "The stone," he says, "was old quarried and of the hardest yolk, and 5¼ inches thick, the bore 1¾ inch diameter, and the time in going through the stone was exactly 2½ minutes; *it ran through it like wood.*"

The Arbroath stone on which Mr. Hunter's machines have been hitherto chiefly employed has been long in great request for foot-pavements, market-places, kitchen floors, &c.; and now that it can be produced by means of machinery in any quantities, will probably become still more and more so. It possesses this great advantage over the Yorkshire flag, that it resists the damp much better and dries more quickly; while it is, at the same time, equally cheap. In this point of view it has but one rival, the Caithness flag, to which however it is, in uniformity and homogeneousness of texture, vastly superior. In Scotland this species of stone, painted and varnished, is now getting into extensive use as a substitute for marble; it is a great deal more durable than Scagliola, and not half so expensive.

YIELD OF CARROTS.—Mr. Wilson, of the Albany Nursery, sowed last spring a piece of ground 111 feet in length, and 39 broad, with carrots, in drills 18 inches apart. The product was 6,321 pounds, topped and freed from dirt. This is at the rate of about 31 tons, or 1,030 bushels, of 60 pounds each bushel, per acre. The ground was first trench ploughed, then well dunged, and ploughed again; unleached ashes were then spread upon the ground at the rate of fifty bushels the acre, the ground well harrowed and the seed sown. The plants were thinned to six inches. Mr. Wilson thinks it would increase the crop, to sow in drills at two feet, and that in this case the crop might be cleaned principally with the cultivator, particularly with Van Burgen's.

Carrots are fine food for all farm stock, and are particularly beneficial to horses, and are considered to be worth for this purpose as much per bushel as oats. At three shillings per bushel, a thousand bushels would be worth $375 00. They are worth at least half this for any kind of farm stock, which would make them still a *very* valuable crop.

THE SAP OF PLANTS.—It is a received opinion among the unlearned, and even some of the learned, that all the sap of trees descends to the roots in autumn, and remains there till the genial influence of spring causes it again to ascend. This is disproved by numberless facts which come under our own observation. "Not only do plants," says Chaptal, "prepare all the juices which are essentail to vegetation, and to the formation of fruits; but after having fulfilled those functions, they continue to extract, from the earth and air, the principles of their nourishment; *these they elaborate and deposit between the bark and wood, to serve for their first aliment on the return of spring, till the development of the leaves, and the excitement of the roots by heat, can provide for their nourishment by the absorption of foreign substances.*" The volume and fluidity of this elaborated sap are diminished, in winter, by the absence of heat and by evaporation.

We gave in our last a communication from Mr. Burrows, detailing the uncommon fertility produced by the wool tags and other refuse of a woollen factory. We have another remarkable fact to narrate, in corroboration of Mr. B.'s statements. Mr. Hubbard, of Middletown, Conn., informs us, that he cut *fifteen tons* of hay from three acres of land, at one cropping, which had been brought to this state of fertility, from a low condition, by the sweepings of his woollen factory. Bets having been made by his neighbors on the amount of the crop, the whole was accurately weighed Mr. H.'s profit at this time may be estimated at $100 per acre—a handsome return for Yankee industry. Chaptal pronounces this manure the most valuable that can be employed.

APPLE POMACE.—On a late visit to the town of Marlborough, in Ulster county, we found that the Mess. Hallocks, very intelligent and extensive farmers, and withal great cider manufacturers, were husbanding their apple pomace with great care, and feeding it to their milch cows. They begin with small feeds of it, and find that it adds greatly to the quantum of milk. The Mess. Hallocks manufacture their refuse pippins into cider separately, and if the liquor does not retain the peculiar flavor of the fruit, it gives a rich and racy liquor, which commands the first price in market. When we practice making cider from a single species of fruit, and that species affording a rich must, we shall treble or quadruple the value of this product of the farm.

This town of Marlborough, by the bye, has undergone, and is undergoing important changes in the productiveness of her lands. Thirty years ago, when we first knew it, it was one of the poorest towns in the country; its agricultural products were trivial, and its wood-drawing population had much ado to make their ends and means meet. It now verifies the remark we have often made, that where nature has done least, industry and skill are the most active, and most successful, in maintaining good habits and good morals. There is no stimulant so salutary as the habit of depending on one's own exertions.

[*From No. 7, of "The Silkworm."*]

It may now be presumed that those who have, during the present season, engaged as adventurers in the silk business, especially those whose knowledge has been gained by reading the "Silkworm," will, by this time, at least have acquired a degree of familiarity with the appearance of the mulberry, and of the silkworm in its various stages; and also have made some proficiency in the general outlines of the silk business, in its various branches. They will probably have mulberry trees coming forward, and a small stock of eggs and other preparations, to commence operations on a more extensive scale, next spring; and will now be turning their attention to the general improvement of their knowledge of the subject, by gathering, from every possible source, such facts and instructions as may increase their stock of information, and prepare them for more regular and extensive operations another season. In this stage of the business, it will not, perhaps, be considered an improper time to present to my readers a kind of summary, by way of recapitulation, to refresh and concentrate their memories of what has been already stated, adding, also, such promiscuous items of information as have been gathered since the work commenced.

THE MULBERRY TREE.

At the time of commencing the "Silkworm," the state of general knowledge of this tree, especially as relates to its furnishing food for silkworms, wore a very different aspect from that which it unavoidably assumes at present. It appeared *then* to be generally taken for granted, that the white Italian Mulberry, as it was then called, was not only, in all respects, preferable to the black, purple, and red, or supposed indigenous class of mulberries, but so much so that it would be altogether unadvisable to attempt the cultivation of silk from worms fed with the latter; that they were not only unpalatable and unwholesome food for the worms, but that the silk made by worms fed on them was coarse and inferior; and, in short, that they could not be considered of any use in the business, except as a temporary resort, merely to sustain the lives of the worms, when the white mulberry could not be obtained.

There are now frequent notices in the public prints, of worms being fed to advantage on the purple and red mulberries, and I have letters from several respectable gentlemen at the Southwest, some of them accompanied with specimens of excellent silk, who have fed their worms on the leaves of those trees; and one of them, in particular, states that his silkworms prefer the leaves of the purple and red, to those of the white mulberry. A beautiful specimen of manufactured silk was exhibited here at the fair a few days since, from worms fed on the black mulberry.*

I should still, however, incline to give the preference, as a main dependance, to the white mulberry, at least for the present; but I mention these instances, to show those who live in the neighborhoods where the forests abound with the purple and red mulberries, as is the case throughout a great part of the southwestern States and Territories, that they may safely commence the business, depending on them, until they can cultivate such as they prefer.

In the great interest excited by this most valuable tree, it was natural to expect that much knowledge would be elicited, and many important facts developed. A much more extensive catalogue of its varieties has been made out, and scientifically classified. Mr. Kenrick, of Newton, Mass., a gentleman to whom I am proud to acknowledge myself indebted for much useful information, especially in the horticultural department, has enumerated and described eight distinct varieties, viz:

1. The Black Mulberry, a tree from 25 to 30 feet high, fruit black and valuable, and makes an excellent wine; the bark may be made into cordage and paper.

2. The Red Mulberry, a larger tree than the black, the leaves frequently 'three lobed,' often palmated; 'dark green above—*downy beneath*.' Fruit deep red or black, of excellent quality; 'superior to the black' tree, 'more hardy.'

3, Japan or Paper Mulberry.—Tree grows to a large size, is a native of China and Japan. The inner bark is used in those countries for making paper and articles of clothing; the fruit not fit for eating.

4. White Italian Mulberry is a tree of rapid growth, but too well known to need description.

5. Shining leaved Mulberry.—The leaves very sharp, pointed and shining; valuable to feed silkworms.

6. Tartarian Mulberry.—The leaves are large, oval and shining. The fruit resembles the black mulberry. The leaves afford silk of the finest quality.

7. Dandolo or Morettiana Mulberry.—This tree takes its name from M. Morette, Professor in the University of Pavia, who, from 'a single tree, had in 1826, multiplied to 120,000.' It is presumed to be hardy. The fruit is at first violet, when ripe, perfectly black. The leaf is of an oval form, sharp pointed, and smooth on both the upper and under sides, of a beautiful shining dark green. It is neither wrinkled nor plaited; is generally about 8 inches wide and 10 inches long.

This tree is peculiarly adapted to be cultivated in the form of a hedge, in which state the leaves can be gathered with great facility. Its superior quality has been proved abundantly by the cebrated Count Dandolo, in Italy, and by some others; and the silk produced by the worms which feed on it, is said to possess a peculiarly fine gloss.

8. Chinese Mulberry, (Morus Multicaulis or Many Stalked Mulberry.)—It may, perhaps, be thought that enough has been said on the subject of this plant in the two preceding numbers, but I deem it of such importance that nothing ought to be withheld which can give any new information respecting it. Notwithstanding all that has been said, fears are entertained by many, that it cannot withstand the cold of our winter; and as new proofs to the contrary are every day received, it will not be taken amiss, if I offer a few of them. I copy the following from Mr. Kenrick's little work, entitled 'The Silk Grower's Guide,' a work which ought to grace the shelf of every person engaged, ever so limitedly, in the culture of silk.

Mr. K. says, "Since the introduction of the Morus Multicaulis to New-England in 1831, this tree has had to contend, in its very infancy, with two winters, such as were never before recorded in the memory of man, or in the annals of our country; winters doubly severe, and with tremendous power to kill.

On the northern declivity of Nonantum Hill, and in the bleakest position, I left exposed, last autumn, the young trees of the *Morus Multicaulis*; the tops with no protection; nature's covering of herbage their only defence at the roots; thus situated, they have borne the winter well.

During the present summer, at the mansion of the Hon. J.

* A large and beautiful twilled handkerchief, of exquisite whiteness, manufactured in a first rate style, the silk uncommonly fine, soft, and glossy, and some skeins of excellent sewing silk, together with some raw silk, sent to Judge Buel, from Mr. Benjamin Young, South Union, Jasper Valley, Kentucky, who states that his silkworms reject the white mulberry leaves altogether, when they can get the black.

F. Wingate, in Windsor, Maine, near the river Kennebec, and between the latitudes 44° and 45°, I saw the *Morus Multicaulis*, young trees, which were planted near the summit of a vast and gently rising ground. Nature's covering of dried herbage alone protected the roots. The tops, exposed, had borne the extreme cold of the last winter wonderfully well.

At Walpole, in New-Hampshire, and at the farm of P. Mason, Esq., are the trees of the *Morus Multicaulis*, which have borne, unprotected and uninjured, the rigors of the three last winters.

I saw, also, during this summer, at the residence of S. V. S. Wilder, Esq., in Bolton, and in a cold and moist soil, and bleak northerly exposition, the trees of the *Morus Multicaulis*, which, unprotected, had borne the two last winters well.

Also, I saw, during July of this same summer, at Northampton, and at the place of Mr. Whitmarsh, the trees of this same Mulberry, of four years old, which had also endured, without protection, the extreme severity of the last winter.

It is well worthy of remark, that in the immediate neighborhood of every place which I have named, except the first mentioned, the thermometer had descended from 30° to 40° below zero, during the coldest days of last winter.

While in Mansfield, Connecticut, and elsewhere, even large trees of the common white mulberry have, during the last winter, suffered badly, or been killed outright.

Mr. Lyman, of Manchester, adjoining Hartford, in the same State, has cultivated this mulberry for four years, and never had protected them at all. Passing that way, during the present summer, by chance I saw the *Morus Multicaulis* in a flourishing state—plants four or five years of age, uninjured, in a naked and unprotected soil. He had, indeed, during the last winter, lost many young trees of this mulberry, of but a single summer's growth, in a bare and unprotected soil. These were all he had ever lost. This same winter, which had destroyed the last named, and yet spared all the *Morus Multicaulis* of older growth, and of former years, destroyed also, to the root, a whole nursery of cherry trees three years old, which stood beside them.

Mr. Davenport, of Colerain, in the northwest part of Massachusetts, is an experienced cultivator. I have just written to him, but my letter has not reached him; he is absent in Connecticut, where he has just stated to Mr. Bestor, that his *Morus Multicaulis* had endured the last severe winter unprotected and unharmed. Both these gentlemen, from their own experience, commend any thing but a low, moist, or very rich soil. With all authors, they agree in commending, for this mulberry, a soil of moderate fertility; a dry soil on a friable subsoil; on gentle elevations or declivities."

I have, in the first number, recommended the plan of cultivating the mulberry in dwarf trees, and in hedge rows, in preference to standard trees, in the orchard form; and as I think the practice cannot be too stronly urged, I will here give the reasoning of Mr. Kenrick on the subject, after reading which, I think no person can be found, who would give the preference to the troublesome and dangerous mode of climbing standard trees, which, it is pretty well ascertained, yield a much less quantity of leaves from the same ground.

"The plan of raising dwarf mulberry tree plantations," says Mr. K., "is that which I shall now recommend for general adoption, for the following reasons:

"1. They arrive to a state of productiveness with comparatively little expense of time and tillage.

"2. Sufficient sun and air are admitted to the tree, to render the leaves of the first quality, and to enable them to put forth early.

"3. The ground is more suddenly and completely filled and occupied, than by planting standards.

"4. The tree is more easily managed, and its form controlled; and the leaves are more easily gathered. This mode, it is understood, is much practised in India, and was formerly in France, if not now.

"In Persia, as we are informed, the trees are kept low, and not suffered to rise over six or eight feet in height. Broussa, a city of Turkey, at the foot of Mount Olympus, is famous for its silk, and is surrounded by mulberry plantations; the trees, says Commodore Porter, are planted in rows, not more than two or three feet apart, and kept pruned low, for use, in the season for gathering the leaves, so that a man may reach the top. At other places in this great silk district, the same system is pursued."

I have stated, in No. 5, that it has been suspected, by some skilful horticulturists, that the *Morus Multicaulis* is an artificial variety, produced in China, through a succession of ages, and propagated only by transfer from the wood.

But this suspicion or opinion is also rendered the more doubtful by recent circumstances—so slow is the growth of human knowledge. The mind is obliged to vibrate like a pendulum from one side of a proposition to the other, many times, before it can settle upon certainty. All we can rely upon, in such cases, is facts. Doct. Stebbins, of Northampton, Mass., has imported a small quantity of the seed, through the agency of Missionaries in India, which proves to be genuine. This, and some other facts on the affirmative side of this question, afford sufficient grounds to justify the most thorough perseverance, in endeavoring to propagate the Chinese Mulberry from the seed.

The fact contained in the following letter from Dr. Beardslee, a gentleman of science and observation, certainly conduces to the establishment of the theory that trees from the seed will withstand the severity of our climate better than those propagated in any other way. We hope the Doctor and other gentlemen will continue their observations, and communicate to us the result.—[SILK CULTURIST.]

Mr. Editor,—Dr. Eli Ives, of New-Haven, has in his garden three *seedling* Chinese Mulberry trees. In the summer of 1833, a small Chinese Mulberry tree in his garden, then, I believe, in the second year of its growth from the slip, produced one berry, which ripened. This was planted in August, and the same season produced the three trees I have mentioned. They have now endured two winters—are four feet high, were very slightly injured by the last winter, and show wood which is well hardened and perfect to the tips of the twigs. The trees raised from slips, though standing within a few feet, were severely injured by the last winter, and show wood which is green, succulent, and badly matured.

I have seen it suggested, that seedling Chinese Mulberry trees would prove more hardy than those raised from slips, and I communicate this fact, as tending to confirm that opinion—and also to correct what seems is an erroneous impression, that this tree cannot ripen its seed in our climate.

I am, sir, yours, &c.,

H. C. BEARDSLEE.

Monroe, Oct. 5, 1835.

But be the case as it may, respecting propagating by the seed, such will be, for some time to come, the difficulty of procuring the seed, that it will be advisable to adopt other modes of propagation. Fortunately, such is the facility by which it may be multiplied by layers, by cuttings, or by grafting, that,

though probably with a little more labor, its introduction, or rather its multiplication, may be effected with much less tardiness than by the seed.

By either of the above modes, a single young tree of the Chinese Mulberry, of two or three years of age, may be made to produce a very considerable number in a season; and, suppose, for instance, one such tree to produce ten, then in three years each tree may be multiplied to a thousand. As a proof that this may be effected, I will here insert the following extract from the Silk Culturist, a periodical published at Hartford, Connecticut.

"EXTRAORDINARY INCREASE.

"Nurserymen, unacquainted with the cultivation of the Chinese Mulberry, are probably not aware of the extent to which they may be multiplied, in a single season. In order to show the number that may be produced from a single tree, we will state the result of an experiment by Mr. Bestor, of Suffield, the present year. He laid down the branches of two trees, and thereby produced *two hundred and two* in addition to the original stocks. From the product of one tree, he has already sold forty-eight, at twenty-five cents each, receiving therefor the very handsome profit of $12, and having *one hundred and fifty-four remaining on hand.*"

To persons but slightly acquainted with horticulture no instructions for either of the above modes of cultivation will be necessary; but with a great proportion of those who will engage in the culture of silk, this will not be the case. I will, therefore, quote a few instructions which may answer the purpose for those who are wholly ignorant of the subject, and which may serve as starting points, from which they may improve by practice.

To Propagate by Cuttings.—From Mr. RUSH'S *Report to Congress, May* 11, 1826.

CUTTINGS.—These should be taken from the perpendicular shoots, and particularly those that terminate branches: these will certainly produce straight and handsome trees; while cuttings taken from horizontal branches will ever have an inclination to grow in a spreading manner. The cuttings should be of the last summer's shoots, and from six to fifteen inches in length. Plant them in rows, in shady borders, early in the spring, and about two-thirds their length in the ground; close the earth well about them, and, in dry weather, let them be watered. After a year, they may be transplanted into open nursery rows, if well rooted.

The following mode of grafting, as peculiarly applicable to the mulberry, is from the same work:

"A branch must be selected, sound, and of the growth of the preceding year, when possible, and while the sap is running: this is to be cut off some inches from the trunk, or further off, according to its strength or size. The annexed cut represents a piece of a branch, separated, but we must suppose it attached to the trunk. From the point A to the point B, the bark is to be slit in strips, by the edge of a pruning knife; and these strips are to be gently detached from the wood, (without bruising them,) as is seen at E. While an assistant is engaged in this operation, another prepares a cylinder, or tube C, having a bud, D, or several buds, and of equal diameter to the wood A, when barked; then without loss of time, it is to be slid upon the wood, until its lower extremity

touches the basis of the strips. If the cylininder applied to the wood is proportioned to it, and if it covers all the wood, and unites exactly with it, the strips are to be cut off below the cylinder, by a circular cut; and after having made the two barks join, the united parts are to be covered with a mixture of turpentine, wax, and rosin, spread on thin leather. Every boy is acquainted with the mode of procuring a pipe to make a whistle from a willow, by cutting off a branch, and gently beating the bark, until it loosens from the wood. The mulberry pipe is to be procured in the same manner."

"When it is difficult to find a branch, the bark of which will fit exactly the branch, which is cut in strips, the following expedient may be adopted: If it be too narrow, a branch must be slit longitudinally, on the side opposite to the bud, and the cylinder being taken off, is to be applied to the wood; then a part of the strip is to be raised, that corresponds to the deficiency in the cylinder, and must be divided in its whole length, of the breadth wanting in the ring, so that this division fills the vacant space. Finally, raise up, and surround it with strips, as already directed. If the bark cylinder be too large, cut it to the diameter of the wood, then fit the edges as nearly as possible, and cover them with strips."

Mr. Wilson, the partner of Judge Buel, whose reputation as a scientific horticulturist is too well known to need any encomium, assures me that the simplest and most expeditious mode of grafting the mulberry is, to scrape away the ground, and cut off the stalk, just below the surface, and splitting the top of the stalk, insert the scion in the common mode of grafting, wind on a little loose hemp, or flax, to unite the parts, and replace the ground round the parts united, packing down without any other protection.

For propagating by *layers*, the following instructions are given by Mr. Kenrick, (Silk Grower's Guide.)

"LAYERS.—Layers are the side shoots bent down and secured by hooks, and partly covered with earth, their extreme ends only being left out; thus managed, in spring, or at midsummer, they soon take root, and are separated from the main plant in autumn."

I will here, for the present, quit the subject of *Morus Multicaulis*, urging and admonishing every adventurer in the business to omit no effort in making preparations for another, to obtain as many seedlings and young trees as possible, and from them, as fast as it can be done, transform, by the modes above stated, his stock of white, or other mulberry trees, into an equal or greater stock of the many-stalked mulberry. In the mean time he can be regularly increasing his stock of worms, and forwarding his other operations.

If eggs are not prepared for another season, they ought to be procured, or at least engaged in season, as the demand will be much greater for them next spring, than at present. Should they be procured in the winter, if they are to be transported any distance, it will be necessary to keep them from frost, and when obtained, to keep them in a dry, cool place, and where they will not be destroyed by enemies, for which directions have been given in a former number.

FIXTURES.—There are, and probably have been, from time immemorial, two distinct modes of breeding and managing silkworms; *one* is to hatch and feed them, on common tables, or on loose boards, and even on rough boards, sometimes covered with old newspapers, or other waste paper, and to transact the business in a spare room, or garret in the dwelling, or even in barns or sheds; and to trust to the natural vicissitudes of heat, cold, moisture, and dryness, without any artificial means

to regulate or correct them. *The other* is, to prepare a cheap building, suitable to the exigencies of the case; and to provide an apparatus for regulating the atmosphere, as well as to protect both the eggs and the worms against the natural enemies, to which they are otherwise much and constantly exposed.

The first of these modes has been in practice in Connecticut, since the first introduction of the silk business there, and also in Turkey, in a still less improved manner, by feeding the worms upon the floor, instead of on tables, or on boards. The *second* plan is adopted in Italy, and France, though there may doubtless be much silk made in both those countries, by the first plan. There are persons who advocate the first plan, to the total exclusion of the second; and there are circumstances under which it may, without doubt, be most advisable to adopt it; but I should certainly think that any person, whose circumstances would admit of the choice, would prefer the latter, on account of safety, profit, and pleasure.

We know that large quantities of good silk have been produced in Connecticut, in the mode first above stated; and it is no less true, that at least as good silk is made in Turkey, by silkworms fed on the floor, and without even that cleanliness which is observed in Connecticut. But it is equally true, that millions of worms have been lost by an improper state of the atmosphere, which might have been easily saved by proper means to regulate it; and no less true, that with proper conveniences, a much less quantity of help is necessary, to attend a given quantity of worms, than would be required without them.

To persons engaging in the business experimentally, with small means, the simplest method will undoubtedly be the best, at least for one or two seasons. But, after that, even with such, as the expense of an apparatus is very small, if they have any taste for proceeding systematically, they will, in all probability, decide in favor of a proper apparatus.

The silkworm is a most thrifty insect, and from the perfection of its constitution, and the simplicity of its food, could hardly be considered liable to disease, if it were kept, at all times, in a situation congenial to its nature; but still, such is the delicacy of its organization, that its health cannot be depended upon when out of its proper element. Indeed, when thus treated, a whole community, ever so numerous, is liable to be swept off by epidemic, and even pestilential diseases. Their constitution requires a fresh and dry atmosphere, with a temperature without extremes of heat or cold, especially the former;* within the range between 58 deg. and 70 deg. there will be no danger. A moist atmosphere ought to be corrected, which is easily done by a light flame, of dry shavings, or other light combustibles. The degree of moisture can be discovered by the hygrometer, or by the feelings of any one accustomed to judge of the weather. The light is favorable to the health of the silkworm, but the direct rays of the sun injurious. A strict observance of these remarks, with correct feeding, according to the rules already given, with proper cleanliness, will secure the health and vigorous action of the silkworm; without that observance, they may succeed well, as they have often done, or they may totally fail, as they have sometimes done.

Exclusively of the building and its proper fixtures, all the apparatus necessary to proceed systematically, are a thermometer and hygrometer, which will cost from three to five dollars, and a common box stove, which, in the Northern States, almost every family possesses.

The description of a house, given by Mr. Kenrick, is very simple, and will be found equally cheap and convenient.

"The house for silkworms should be in airy situations; they may be built of one or two stories, and may be constructed of rough boards, matched or tongued. They should be provided with numerous windows of glass; light being essential to the health of the silkworms, and perpetual darkness injurious; they should be protected, however, from the direct rays of the sun. Gratings of lath, or of bars of iron wire, of the thickness of a goose quill, may protect the openings of the windows. Numerous openings and doors in the sides, of suitable dimensions, should also be provided for the admission of fresh air; this being, equally with light, indispensable to their health. These openings at the sides may be low down, and near the floor, and are furnished with slides; a strip of board connecting all the openings on a side, of a whole extensive and continuous range, may serve as a common handle, by which all may thus, in an instant, be opened and shut. Near the top, or more properly in the roof, are numerous other openings, or ventilators, through which the impure air will pass out. Those in the roof may be provided with slides, or open with cords, which may be so connected, that all may be opened or shut at the same moment of time. One or more chimneys may be added, with broad hearths, for light combustibles or fuel, and sudden or flame fires. These, however, are only for occasional use. They serve suddenly to put in motion, and to rectify or expel a stagnant and moist atmosphere, rendering it at once more healthy and electrical."

In experimental operations, it will perhaps be advisable to feed the worms on boards, without extra expense; but in a regular *establishment*, every one who reflects a moment will decide in favor of hurdles, not only as altogether preferable, on account of cleanliness, but an immense saving of time, as well as room. The hurdle is a simple frame of light wood, and the size, perhaps the most convenient, will be six feet long, and three feet wide. The space enclosed by this frame is occupied by interlining with small strips of rattan, such as is used by milliners, or by twine; or a common netting of twine will answer the purpose. The netting or lacing may be fastened to the frame in the manner of fastening the lacing on chair bottoms, or by small brads, driven into the wood. The meshes may be from half to three fourths of an inch.

A building for a cocoonery ought to be 24 feet in width, whatever may be its length. This will admit two double ranges of hurdles running lengthwise of the building. Every six feet in length of the building will then contain four hurdles in each tier, in each story, leaving a passage of three feet next to the sides of the building, and six feet through the middle. These hurdles are sustained by two double ranges of posts, of common scantling, running also lengthwise of the building, and six feet apart in the ranges, and each two corresponding parts, crosswise of the ranges, about four feet apart. In each double range across these posts, are nailed strips of boards, an inch or more in width, on which strips the hurdles rest, and may be drawn out, or slid in, in the same manner as drawers, so that the back of each two hurdles meet in the middle of the range, and may be drawn out into their respective passages.

There may be three, four, or five tiers of hurdles, but I should think four would be the most convenient number; and about 18 inches above each other. Each hurdle ought to be about two inches narrower on the front or out side, than the one be-

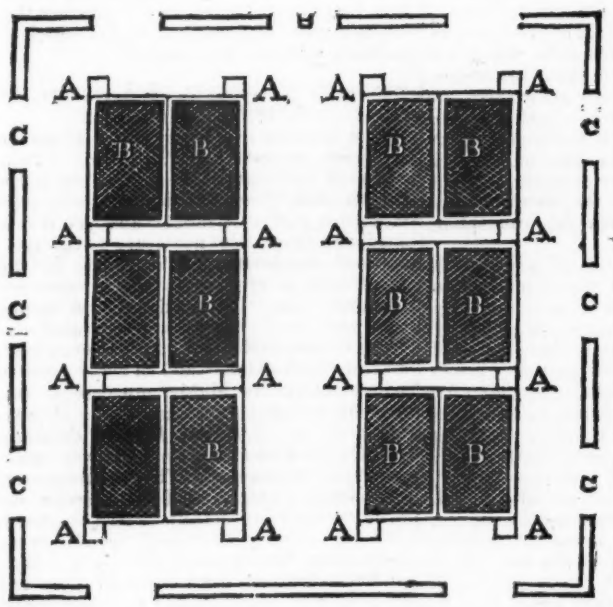
* Large numbers of silkworms have sickened and died suddenly, on the temperature being raised to about 100° of Fah

low it, that in case any worms fall from the tiers above, they will be caught on the next below, and a small ledge, raising round the edge of the hurdle, would be serviceable in preventing the worms from crawling off.

Beneath each of these stages or hurdle-shelves, at the distance of about an inch and a half, should be either another shelf of thin boards, or lath, placed edgewise, on which papers may be laid to receive the litter of the worms, which will fall through, and which may be removed and the place kept clean, without removing or disturbing the worms.

In a building of one story, of the width above named, with two double tiers of hurdles, and four tiers high, each length of the hurdles, or 6 feet of the building, will accommodate 43,000 worms; so that a building 24 feet square and one story high, will be sufficient for 120,000* worms; and if two stories, twice that number. Every precaution should be taken to guard the building against cats, rats, mice, ants and spiders. Ants are dangerous enemies to the worms, but may be guarded against by whitewashing, and still more effectually by putting a little tar or turpentine round the feet of the posts which sustain the hurdles.

I shall here subjoin the ground plan of the floor of a house, to be 24 feet square.



This plan of a cocoonery, or house for silkworms, it will be seen, is either a house entire, of 24 feet square, to contain three lengths of hurdles, or 12 hurdles on each floor in each tier, or it may be considered as a section of a house of any length, in which case every additional six feet in length will accommodate another length of hurdles of four on each floor in one tier, and if four tiers high, of sixteen on each floor. Every length of six feet in the house, exclusive of passages, will contain, on each floor, 288 square feet of hurdles.

* I have here consulted the statements of Dr. Pascallis, Mr. Rush, Mr. Cobb, and Mr. Kenrick—and taken the mean between them, which is 220 feet of space to 40,000 worms; but I cannot think it is correct. It is strange that four such authorities should coincide in falling into such an error. 220 square feet would contain 31,680 square inches, or about three-fourths of a square inch to a worm. Now, allowing the silkworms to be three inches long and half an inch diameter, each worm would cover one inch and a half; and yet it is stated, by the same authorities, that the worms should not touch each other. I should think a much greater space necessary. In this, however, practice will easily decide.

[From Mr. Kenrick's Silk Grower's Guide.]

DR. DYER'S ESTALISHMENT, AT PROVIDENCE.

The building is one hundred and fifty feet long, twenty feet wide, and one story high, with a floor, the whole constructed of rough boards. The insects which I saw here during this last summer, to the number of 700,000, were fed on thin boards, disposed in stages or horizontal courses. Light was admitted at a sufficient number of glazed windows. They here calculate on a succession of crops of silk during the season.

The establishment of Mr. Whitmarsh, at Northampton, is new, and has but just commenced its operations. The building is constructed of rough boards, and is two hundred feet long, twenty-five feet wide, and two stories high; it is elevated on supporters of stone; and there are openings beneath the hurdles and through the floor, for the admission of the outer air. There are ventilators on the sides of the lower story near the top, also numerous openings or ventilators in the centre of the roofs. This establishment has a small steam engine for moving the reels, and the hot water is furnished from the boiler.

SPACE NECESSARY FOR SILKWORMS.

It would seem that most writers on this subject have either literally copied each other, as to the measured space necessary for the worms, at their full growth, or they have made such aggregate variation, over or under, without going into any detailed calculation, as judgment or fancy suggested. Not only the wide difference of some of these statements from some others, but from reason, and from instructions given elsewhere, by the same writers, make it necessary the silk adventurer should have some better light on the subject, or he will find himself in a labyrinth of confusion. To show the disagreement between some of these instructions and the nature of the case, I will here subjoin several of them in a tabular form, so that they may be compared at one view. It is urged, as an axiom, by several of the writers, that the worms should not touch each other. Now, the worms, at their full length, are at least three inches long, and nearly or quite half an inch diameter in thickness; consequently each full grown worm will cover a space of one and a half square inches, even if they are packed closely side by side.

Space required for 40,000 worms, according to	ft.	in.	Space to an inch.
Mr. Rush, Secretary of U. S. Treasury,*	183	4	$\frac{666}{1000}$ of an in.
Mr. R.'s table from Bonafous of Piedmont,†	272		$\frac{24}{100}$ of an in.
Dr. Pascallis' Book,‡	226		$\frac{338}{1000}$ of an in.
Mr. J. H. Cobb's Manual,	183	4	$\frac{666}{1000}$ of an in.
Count De Hazzi, of Munich,§	240		$\frac{664}{1000}$ of an in.
Mr. Kenrick,‖	540		$1\frac{94}{100}$ inches.
Mr. Rhind,¶			$3\frac{22}{100}$ inches.

If any writer or silk grower can tell how silkworms, whose bodies cover one and a half square inches, can feed on a space of $\frac{666}{1000}$, or a little more than half a square inch, without touching each other, I will give him credit for unfolding a mystery. Mr. Kenrick's estimate gives $1\frac{94}{100}$ inches, nearly 2 inches to each worm, and I presume, if he gives it a re-examination, he will think even *this* a little mysterious. Indeed, I do not see, even in Mr. Rhind's statement, which I have given in the "Silkworm," how the worms can avoid touching each other, unless they can be persuaded to lie entirely still.—[Ed. S. W.]

* Mr. R.'s Report, p. 113. † Same, p. 180. ‡ Vol. ii. p. 23. § Letter from I. Mease, p. 175. ‖ Silk Grower's Guide. ¶ Silkworm, No. 3.

From the Farmers' Register.

ON THE USE OF LIME AS A MANURE.

By M. PUVIS.

Translated for the Farmers' Register from the *Annales de l'Agriculture Francaise*, of 1835.

The publication of the following communication to the *Annales de l'Agriculture Francaise*, was commenced in the February No. of that journal, (which was received here in May,) and the June No. contains the end of the first part, "*On Liming*," and enables us to offer the translation of that portion to our readers. Only a few pages of the next portion of the series, "*On Marling*," has yet appeared, and not enough to permit a judgment to be formed of its worth.

Though there are many deficiencies in this treatise on liming—and also opinions as to the theory of the action of lime, in which we cannot coincide—still, on the whole, we consider it as presenting far more correct views, and more satisfactory information, both on theory and practice, than any other work on liming that we have before seen. In other points, and those of most importance, the facts here presented, (and now first learned from any European authority,) strongly sustain the views maintained in the *Essay on Calcareous Manures*. It would be both unnecessary and obtrusive to remind the reader of these points of difference, and of agreement, whenever passages exhibiting either may occur. They will, therefore, generally be submitted in the author's words, without comment. A few exceptions only to this rule will be made, in cases which appear particularly to call for them.

We have no information whatever of M. Puvis, the author of this treatise, previous to the appearance of the commencement of the publication in the *Annales*. But he is evidently well informed on his subject, and is stated by the introductory remarks of the French editor, to be entitled to all respect, for his long experience, and his practical, as well as scientific investigation of the subject. If, then, there remains no ground to distrust his judgment, or his facts, the statements made are most important to a very large portion of this country, which has heretofore been generally supposed to be deprived of all possible benefit from the use of calcareous manures, on account of their remoteness and high price of carriage. M. Puvis states that the most successful and profitable liming in Europe (for the expense incurred) is in repeated applications of very small dressings—making less, on the average, than four bushels of lime to the acre, annually. This small amount, *if really as efficacious as is alleged*, would cost so little in labor and money, that the limits of the region capable of being limed may be very far extended. It would not matter though the applications should require to be repeated forever, provided the annual returns gave good profit upon the annual expenses; and far greater will be the profit, if (as we think) the soil ultimately will no longer require such repetitions—or only at very distant intervals of time—and still be a highly productive, because it has been made a calcareous and fertile soil.—[Ed. Farm. Reg.]

On the Different Modes of Improving the Soil.

To improve the soil is to modify its composition in such manner as to render it more fertile.

This definition, which might be extended to manures charged with vegetable mould [*humus*] or animal substances, which also modify the composition of the soil, is limited by French agriculture to substances which act upon the soil, or upon plants, without containing any notable proportion of animal or vegetable matter.

It is said that manures, [putrescent or enriching,] serve for the nutriment of plants. But it is the same as to substances improving to the soil, which furnish to it matters which it needs to be fruitful, and which furnish to vegetables, the earth and saline compounds which enter as essential elements in their composition, their texture and their products. Such improving substances ought well to be regarded as nutritive.*

Thus lime, marl, and all the calcareous compounds employed in agriculture, since they furnish lime and its compounds, which sometimes form half of the fixed principles of vegetables, ought also to be considered as aliments; or, what comes to the same, as furnishing a part of the substance of vegetables. Thus again, wood-ashes, pounded bones, burnt bones, which furnish to vegetation the calcareous and saline phosphates which compose a sixth of the fixed principles of the stalks, and three-fourths of their seeds, ought well to be considered, and surely are, nutritive.

What then particularly marks the distinction between manures which improve the soil [*amendemens*] and alimentary manures, [*engrais*] is, that the former furnish, or the greater part, the fixed principles of vegetables, the earths, and salts, which are abundantly diffused throughout the atmosphere, whence vegetables draw them, by means of suitable organs: and what is most remarkable, is, that the vegetable, by receiving the fixed principles of which it has need, acquires, as we shall see, a greater energy to gather for its sustenance the volatile principles which the atmosphere contains.

The greater part then of soils, to be carried to the highest rate of productiveness, require manures to improve their constitution. Alimentary manures give much vigor to the leafy products—but they multiply weeds, both by favoring their growth, and conveying their seeds—and they often cause crops of [small grain] to be lodged, when they are heavy. Manures which improve the soil, more particularly aid the formation of the seeds, give more solidity to the stalks, and prevent the falling of the plants. But it is in the simultaneous employment of these two means of fertilization by which we give to the soil all the active power of which it is susceptible. They are necessary to each other, doubling their action reciprocally; and whenever they are employed together, fertility goes on without ceasing—increasing, instead of diminishing.

The greater part of improving substances are calcareous compounds. Their effect is decided upon all soils which do not contain lime, and we shall see that three-fourths, perhaps, of the lands of France are in that state. The soils not calcareous, whatever may be their culture, and whatever may be the quantity of manure lavished on them, are not suitable for all products—are often cold and moist, and are covered with seeds. Calcareous manures, by giving the lime which is wanting in such soils, complete their advantages, render the tillage more easy, [destroy] the weeds, and fit the soil for all products.

The improving substances have been called *stimulants*; they have been thus designated because it was believed that their effect consisted only in stimulating the soil and the plants. This designation is faulty, because it would place these substances in a false point of view. It would make it seem that they brought nothing to the soil, nor to plants—and yet their principal effect is to give both principles which are wanting. Thus the main effect of calcareous manures proceeds from their giving, on the one hand, to the soil the calcareous principle which it does not contain, and which is necessary to develope its full action on the atmosphere—and on the other hand, to vegetables, the quantity which they require of this principle, for their frame work and their intimate constitution. It would then be a better definition than that above, to say that to *improve* the soil is to give to it the principles which it requires, and does not contain.

Importance of Manures which improve the Constituion of Soils.

The question of improving manures is of great interest to agriculture. This means of meliorating the soil is too little known, and above all, too little practised in a great part of France—and yet it is a condition absolutely necessary to the agricultural prosperity of a country. In the neighborhood of great cities, alimentary manures being furnished on good terms, may well vivify the soil; but animal manures cannot suffice but in a few situations, and of small extent—and in every country where tillage is highly prosperous, improving manures are in use. The Department of the North (of France) Belgium, and England owe to them, in a great measure, their prosperity. The Department of the North, (which is, of all Europe, the country where agriculture is best practised, and the most productive,) spends every year, upon two thirds of its soil, a million of francs in lime, marl, ashes of peat and of dead coal, [*houille**] and it is principally to these agents, and not to the quality of the soil, that the superiority of its production is owing. The best of its soil makes part of the same basin, is of the same formation, and same quality, as a great part of Artois and Picardy, of which the products are scarcely equal to half the rate of the North. Neither is it the quantity of meadow land which causes its superiority; *that* makes but the fifth part of its extent, and Lille, the best *Arrondissement*, has scarcely a twentieth of its surface in meadow, while Avesne, the worst of all, has one-third. Nor can any great additional value be attributed to the artificial meadows, since they are not met with except in the twenty-sixth part of the whole space. Neither can this honor be due to the superfluous of naked fallows, since in this country of pattern husbandry, they yet prune up one-sixth of the ploughed land,

* The two classes of manures which are described generally above, are conveniently designated in French each by a single word. "*Engrais*," which we can only translate as manure, is limited in signification to such substances as directly enrich soils, and feed growing plants—and "*amendemens*," signifying substances which alter and improve the constitution, texture, and indirectly, the fertility of soil, but the operation of which is not to furnish food to plants. In speaking of the *action* of these different classes, the sense may be rendered, though not very precisely, by the words "enrich," and "improve"—but there is no one English term that will convey the meaning of either class of substances. "Alimentary manures" will be used for the first class, and "manures improving the constitution of soil," or some similar awkward, but descriptive phrase, can only render the meaning of the word "amendemens"—useless "improvers" could be tolerated as a substitute, for convenience. TR.

† *houille du department du Nord.*

every year. Finally, the Flemings have but one head of large cattle for every two hectares* of land, a proportion exceeded in a great part of France. Their great products then are due to their excellent economy and use of manures, to the assiduous labor of the farmers, to courses of crops well arranged, but above all, we think, to the improvers of soil, which they join to their alimentary manures. Two thirds of their land receive these regularly: and it is to the reciprocal action of these agents of melioration, that appears to be due the uninterrupted succession of fecundity, which astonishes all those who are not accustomed continually to see the products of this region.

At this moment, upon all points in France, agriculture, after the example of the other arts of industry, is bringing forth improvements; in all parts especially, cultivators are trying, or wishing to try, lime, marl, ashes, animal black. It is this particular point in progress, above all, for which light is wanting; and this opinion has induced the preparation of this publication. Since more than thirty years, the author has devoted himself, from inclination, to agriculture; but he has been especially attentive to calcareous manures. He has studied in the practice of much extent of country, in his own particularly, in personal experiments, and in what has been written on them both by foreigners and countrymen. An *Essay on Marl*† has been the first fruit of his labors; an *Essay on the use of Lime* will soon be ready: it is with these materials that he now sets himself to work. To prepare for this object, a series of articles, of the nature of a recapitulation rather than of a regular work, it was necessary to be concise, and yet not to omit any thing essential. It is proper then that he should limit himself to the prominent parts of his subject, those especially useful to practice. His advice will then be as often empirical as regular, and his directions will be precise, although supported by few developements.

An extract from this work has appeared in the *Encyclopedie Agricole:* here it will again appear, but by separate articles, which will be corrected by a systematic general view of theory, founded on practice. This is the moment for multiplying publications on this subject, because that in almost all parts of France, it is the point in agriculture most controverted,—that which induces the most labor and the greatest expenditures—which presents most doubts—and which has consequently most need of being made clear.

We shall not enlarge here upon the manner in which improving manures act: we will put off this important question, with its developements to the article on lime. Here we only present the theory. Hereafter, that which we will hazard will be founded upon facts, and yet we will not promise these developements, but for the purpose of enlightening and directing practice.

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* The hectare is very nearly equal to two and a half English (or American) acres. See account of French Weights and Measures, p. 506. Vol. II. Farm. Reg.—Tr.

† *Essai sur la marne*, published 1826, at Paris. This is the first notice which we have had of the existence of this work, and have forthwith sent for a copy, as well as for one of the author's forthcoming *Essay on the use of Lime*, that no source of information on this important subject may be excluded. But it may be inferred (from the author's expressions) that these more extended works will contain nothing more of what is essential, than is presented in this condensed form, prepared by himself for the *Annales*. Ed. Far. Reg.

Of the various kinds of Improving Manures.

The first in order, and the most important, are the calcareous manures. We comprehend under this name, lime, marl, old plastering mortar, and other rubbish of demolished buildings, beds of fossil shells, [*falun*]* or shelly substances, plaster or gypsum: experience and reason will prove that we ought to arrange in the same class, and by side of the others, wood ashes, ground bones, and burnt bones. We will not place in the same list the ashes of peat, of dead coal, and red pyrotous ashes: their effect is not owing to their lime, but (as will be seen afterwards,) rather to the effect of fire upon the earthy parts, and particularly upon the argil which they contain.

We will next in order treat of manures of the sea, or saline manure, of different kinds, of mixtures of earth, of calcined clay: and finally, of paring and burning the turf, and the different questions which peat presents in agriculture.

Of Liming—On the Use of Lime for the Improvement of Soil.

1. Among the immense variety of substances, and of combinations which compose the upper layers of the globe, the earthy substances, silex, alumine, and lime, form almost exclusively the surface soil: the greater portion of other substances being unfit to aid vegetation, they ought to be very rare upon a surface where the Supreme Author willed to call forth and to preserve the millions of species of beings of all nature, which were to live on its products.

It was also a great benefit to man, whose intelligence was to be exercised upon the surface of the soil, to have so few in number the substances proper to support vegetation. The art of agriculture, already so complex, which receives from so many circumstances such diverse modifications, if there had been added new elements much more complicated, would have been above the reach of human intelligence.

2. But among these substance, the two first, silex and alumine, form almost exclusively three-fourths of soils; the third, the carbonate of lime, is found more or less mixed in the other fourth: all soils in which the latter earth is found, have similar characters, producing certain families of vegetables which cannot succeed in those in which it is not contained.

The calcareous element seems to be in the soil a means and a principle of friability. Soils which contain calcareous earth in suitable proportions, suffer but little from moisture, and let pass easily, to the lower beds, the superabundance of water, and consequently drain themselves with facility. Grain and leguminous crops, the oleaginous plants, and the greater part of the vegetables of commerce, succeed well on these soils.

It is among these soils, that almost all good lands are found. Nevertheless, the abundance of the crlcareous principle is more often injurious than useful. Thus it is among soils composed principally of carbonate of lime that we meet with the most arid and barren, as Lousy Champagne, part of Yonne, and some parts of Berry.

3. The analysis of the best soils has shown that they rarely contain beyond 10 per cent. of carbonate of lime; and those of the highest grade of quality seem to contain but from 3 to 5 per cent. Thus the analysis of Messrs. Berthier and Drapiez, show 3 per cent. of it in the celebrated soil of the environs of Lille.

4. But all these properties, all these advantages, all these products, calcareous manures bear with them to the soils which do not contain the calcareous principle. It is sufficient to spread them in very small proportions: a quantity of lime which does not exceed the thousandth part of the tilled surface layer of the soil, a like proportion of drawn ashes, or a two-hundreth part (or even less) of marl, are sufficient to modify the nature, change the products, and increase by one-half the crops of a soil destitute of the calcareous principle. This principle, then, is necessary to be furnished to those soils which do not contain it; it is then a kind of condiment disposed by nature to meliorate poor soils, and to give to them fertility.

Ancient Date of the Use of Lime.

5. Lime, as it appears, has long ago been used in many countries. However, nothing proves that its effect was well known to the Greeks and Romans, the then civilized portion of mankind. Their old agricultural writers do not speak of the use of lime on cultivated lands, nor on meadows. Pliny, the naturalist, tells us, however, that it was in use for vines, for olives, and for cherry trees, the fruit of which it made more forward: and he speaks of its being used on the soil generally in two provinces of Gaul, those of the Pictones and Ædui,* whose fields lime rendeded more fruitful. The agriculture of the barbarians was then, in this particular, more advanced than that of the Romans. After that, all trace of the use of lime in agriculture, is lost for a long time—whether that it had ceased to be used, or only that the notice of it was omitted by writers on agriculture. The trace is again recovered with Bernard Pellissy, who recommends the use of it in compost in moist lands, and speaks of his use of it in the Ardennes. Nearly a century later, Olivier de Serres,† advises its employment in the same manner, and reports that they made use of it in the provinces of Gueldres and Juliers [in Belgium]. He makes no mention of its use in France: but as the practices of agriculture were not then much brought together, and were but little known, it may be believed that at that time, Flanders, Belgium, and Normandy, made use of lime.

In England, liming seems to have been in use earlier and more generally than in France. But then, and in all iime since, good agricultural practices have remained in the particular countries where they were established, without being spread abroad. Now, novelties carry no alarm with them—and in the last twenty years, liming has made more progress than in the two preceding centuries.

Of Soils suitable for Liming.

6. Lime, as has been said before, suits the soils which do not contain it already. To distinguish these soils from others, chemical analysis is, without doubt, the surest means; but it offers often too many difficulties, and lime may be met with in a soil in proportion great enough to exert its power on vegetation, without producing ef-

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* "*Falun.*—Beds formed by shells. There is one of these immense beds in Touraine. The cultivators of that country use this shelly earth to improve their fields." This definition is from Rozier's *Cours Complet*, and though it clearly shows that the substance in question is the same as what is called "marl" in Virginia, it is equally clear that neither of these authors consider *falun* as being *marl*. Tr.

* *Ædui et Pictones calce uberrimos fecere agros.*

† Who wrote on agriculture in the reign of Henry IV. of France. Tr.

fervescence with acids.* But visible characters may furnish indications almost certain. The soils where the cow wheat, [*melampyre*], rest-harrow, [*l'ononis, ou arrete-bauf*], thistles, colt's foot, [*tussilage*], and red popy, spring spontaneously—which produce well in wheat, legumes, (or plants of the pea kind), and especially sainfoin—where the chestnut succeeds badly—which shows but little of dog's-tooth, [*chiendent*], volunteer grasses, or common weeds, [*graminees adventices*], except of the small leguminous kinds—soils which, after being dry, crumble with the first rain—all these are almost certainly calcareous, have no need of lime, nor its compounds†, and would feel from their use, rather ill than good effects.

On the contrary, all soils composed of the moulderings [*debris*] of granite or schistus, almost all sandy soils, those which are moist and cold of the immense argilo-silicious table lands [*plateaux argilo-silicicux*] which separate the basins of great rivers‡ [*petit ajonc*] the heath, *les petits carex blancs*, the whitish moss spring spontaneously—almost all the soils infested with *avoine a chapelets*, with dog's-tooth, with bent grass [*agrostis,*] red sorrel, and the little feverfew—that soil where, unless so clayey as to offer great difficulty to cultivation, only rye, potatoes, and buckwheat, can be made, and where sainfoin and the greater part of the crops of commerce cannot succeed—where, however, trees of all kinds, and especially the resinous kinds, the woodpine, the sea pine, the larch, the northern pine, and the chestnut, thrive better than in the best land—all these soils are without the calcareous principle, and all the improving manures in which it is found, would give to these the qualities of, and nourish the growths peculiar to calcareous soils.

But there, more than elsewhere, it is especially necessary to avoid too much haste. Liming upon a great scale, ought not to be done, until after having succeeded in samll experiments on many different parts of the ground designed to be improved.

Extent of Surface to which Lime is suitable.

7. A great proportion of the soil of France does not contain the calcareous principle. The country of primitive formation—the mountains of which the rock is not calcareous—many soils even, of which the subsoils inclose calcareous formations—the great and last alluvion which has covered the surface, and which still composes it wherever the return waters have not carried it off with them—also extensive surfaces, in the composition of which the calcareous principle had not entered but in small proportions, and which small amount has been used by the successions of vegetation—all these kinds of soil, which compose at least three-fourths of the surface of France, to be fertilized, demand calcareous manures. If it is admitted that one-third of all this space has already received aid from lime, marl, ashes of wood, or of peat, of bones burnt, or pounded, there will still remain the half of France to be improved by such means: an immense task, doubtless—but of which the results will be still more prodigious, since it will cause the products of all this great space to be increased by one-half, or more.

Of the various Modes of Applying Lime to the Soil.

8. Three principal procedures are in usage for applying lime. The first is the most simple, and is the most general wherever lime is obtained cheaply, and where culture is but little advanced in perfection, and hand labor is dear. This consists in putting the lime [the burned limestone] immediately on the ground in little heaps at 20 feet average distance, and each heap containing, according to the rate of limiting, between a cubic foot of the stone, to half that quantity. When the lime has been slaked by exposure to the air, and has fallen into powder, it is spread over the surface, so as to be equally divided.

9. The second mode differs from the first in this respect: the heaps of stone are covered with a coat of earth, about six inches thick, according to the size of the heap, and which is equal to five or six times the bulk of the lime. When the lime begins to swell, by slaking, the cracks and openings in the heap are filled with earth: and when the lime is reduced to powder, each heap is worked over, so as to mix thoroughly the lime and the earth. If nothing hurries the labor, this last operation is repeated at the end of 15 days—and then after waiting two weeks more, the mixture is spread over the soil.

10. The third process, which is adopted where culture is more perfect, where lime is dear, and which combines all the advantages of liming without offering any of their inconveniences, consists in making compost heaps of lime and earth, or mould. For that, there is first made a bed of earth, mould, or turf, of a foot, or thereabout, in thickness. The clods are chopped down, and then is spread over a layer of unslaked lime of a hectolitre* for the 20 cubic feet, or a ton to the 45 cubic feet of earth. Upon this lime, there is placed another layer of earth, equal in thickness to the first, then a second layer of lime; and then the heap is finished by a third layer of earth. If the earth is moist, and the lime recently burned, 8 or 10 days will suffice to slake it completely. Then the heap is cut down and well mixed—and this operation is repeated afterwards before using the manure, which is delayed as long as possible, because the power of the effect on the soil is increased with the age of the compost—and especially if it has been made with the earth containing much vegetable mould. This method is the one most used in Belgium and Flanders: it is becoming almost the exclusive practice in Normandy: it is the only practice, and followed with the greatest success, in La Sarthe. Lime in compost is never injurious to the soil. It carries with it the surplus of alimentary manure which the surplus of product demands for its sustenance. Light soils, sandy or gravelly, are not tired by repetitions of this compost. No country, nor author, charges lime, used in this state, with having been injurious to the soil. In short, this means seems to us the most sure, the most useful, and the least expensive mode of applying lime as manure.

11. The reduction of burnt lime to powder by means of a momentary immersion in water, in handle-baskets, serves much to hasten the slaking, whether the lime is to be applied immediately to the soil, or in compost heaps—some hours in this manner sufficing, in place of waiting two weeks. however, the effect of lime, in this state, may well be different, as we have then the hydrate of lime, and less of the carbonate of caustic lime.* If great rains follow, this process is not without inconveniences, because then the lime, which is already saturated with water, is more easily put in the state of mortar, which ought to be avoided more than every other injury to the manure.

The reduction of burnt limestone to powder, whether it be spontaneous, or by immersion, produces in the compost a bulk greater by one-half or more, than that of the stone—10 cubic feet, producing 15—or a ton, 10 cubic feet. This increase is not uniform with all kinds of lime; it is more strong with rich [*grasses,*] waters, and weaker with the poor [*eaux maigres.*†]

Liming, as practised in different Countries.
In the Department of Ain.

12. The applications of lime in Ain date from fifty years back. At the present time, the soil which has been limed is still more productive than the neighboring, not limed. Nevertheless, liming is but beginning to extend, while marling, which was begun fifteen years later, has already covered many thousands of hectares. This is because marling is an operatin within the means of poor cultivators, being accomplished by labor alone; while liming requires considerable advances, especially in this country where lime is dear, and the dose given is heavy.

The dressings vary in quantity, from 60 to 100 hectolitres the hectare, according to the nature of the ground, and often according to the caprice of the cultivators. Although these limings have not been made with all the care and economy that was desirable, they have been very efficacious, when the soil has been sufficiently drained. The following tables, extracted from the

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* This is a full though indirect admission of the truth of the doctrine of *neutral soils*, maintained in the Essay on Calcareous Manures. TR.

† Though both the truth and the usefulness of this passage, in general, are admitted, yet it is incorrect in the position that none of the "compounds of lime" would be advantageously employed on calcareous soils. On the contrary, the sulphate of lime (gypsum), the most important compound as a manure, next to the carbonate, is most effective where the land has lime in some other form: and indeed, (as has been maintained elsewhere,) it seems generally inert and useless on soils very deficient in lime.—[Essay on Calcareous Manures, pp. 50, 92.]

‡ The character of the lands called by the author "*plateaux argilo-silicieux*," and which he refers to frequently in the cour e of his essay, can only be gathered from the context. They are poor, intractable under tillage, and but little pervious to water. The name indicates their composition to be silicious and aluminous earth almost entirely. It may be inferred that such lands resemble in soil the elevated level *ridges*, which in lower Viaginia separate different water courses, and especially those which, in addition to being miserably poor, are remarkably close, stiff, and "water holding"—and are in some places called "cold livery land," "pipe-clay," or "cray-fish" soils. Soil of this kind, and of the most marked character, is particularly described at page 40, Essay on Calcareous Manures, 2d ed. M. Puvis elsewhere speaks of this "argilo-silicieux" soil as being found every where in France, and as known in different places under the various names of "terrian blanc," "blanche terre," in the south, "boulbenne," in the north, of "terre clytre," and "terre a bois"—and the basin of the Loire, "terre de Sologne." The last name would direct us to the lands of Sologne, which furnish it, as it may be presumed, as being of like quality. Arthur Young says, "Sologne is one of the poorest and most unimproved provinces of the kingdom, and one of the most singular countries I have seen. It is flat, consisting of a pour sand or gravel, everywhere on a clay or marl bottom, retentive of water to such a degree that every ditch and hole was full of it."§ TR.

* The hectolitre contains 6102.8 English cubic inches, or is equal to 2.82. (or about 2.6-7) Winchester bushels. Therefore the hectolitre is rather more in proportion to the hectare, than our bushel is to the acre. The decalitre (named next page) is the tenth of a hectolitre, and of course the "double decalitre," is the fifth. TR.

* An incorrect expression certainly, but literally translated. TR.

† We are unable to give the meaning, with certainty, of these provincial terms. They are probably equivalent to our "hard and soft" water—terms which are as little descriptive of what they mean, as the French "*eaux grasses*" and "*eaux maigres.*"

registers of three contiguous domains, belonging to M. Armand, three years before, and nine years during the progress of liming, give us the means of appreciating the results. The quantities of seed and of crops, are calculated in double decalitres, or in measures of fifths of hectolitres.

Table of product of the domain of La Croisette.

YEARS.	RYE.		WHEAT.	
	Seed.	Product.	Seed.	Product.
1822	110	600	24	146
1823	110	764	24	136
1824	110	744	24	156
1825	107	406	27	251
1826	106	576	28	210
1827	100	504	30	249
1828	90	634	36	391
1829	82	538	48	309
1830	60	307	60	459
1831	78	350	40	417
1832	55	478	68	816
1833	61	529	52	545

Table of product of the domain of Mizeriat.

YEARS.	RYE.		WHEAT.	
	Seed.	Product.	Seed.	Product.
1822	120	487	16	100
1823	120	708	16	103
1824	120	644	18	84
1825	112	504	28	228
1826	120	677	20	115
1827	115	594	20	162
1828	118	726	40	328
1829	104	566	41	277
1830	79	298	71	477
1831	91	416	43	326
1832	79	411	75	786
1833	76	616	48	351

Table of product of the domain of La Baronne.

YEARS.	RYE.		WHEAT.	
	Seed.	Product.	Seed.	Product.
1822	110	505	22	180
1823	110	643	22	138
1824	110	662	24	149
1825	102	398	32	252
1826	110	612	32	187
1827	107	546	34	204
1828	98	696	38	343
1829	84	608	40	268
1830	91	389	59	374
1831	92	411	40	295
1832	70	512	80	649
1833	75	511	51	471

The application of 3000 hectolitres [8,490 bushels] of lime, of the value of 6000 francs [$1116] upon 32 hectares [80 acres] of ground, made successively during nine years, has then more than doubled the crops of winter grain, the seed being deducted. The other crops of the farms have received a proportional increase; and the revenue of the proprietor, in doubling, has annually increased two-thirds more than the amount of the sum expended in the purchase of lime. Still, there is not yet half the arable land limed, since of 66 hectares, only 32 have received this improvement.

The products of 1834 are still greater than those of 1833. But these are sufficient to prove the importance and utility of applying lime to suitable soils.

Many other examples sustain these results; and from them all it appears, that the wheat seedings are increased from double to triple—that the rye lands, from bringing four to five [to one of seed] in rye, are able to bring six to eight in wheat—and that other products are increased in proportion. The melioration then is, relatively, much greater upon bad ground than upon good, since it is two-thirds and more on the wheat land, and on the rye lands the crop is increased in value three-fold.

Flemish Liming.

13. The use of calcareous manures in the department of the North, as in Belgium, appears to be as old as good farming. It is now much less frequent in Belgium. The ancient and repeated limings have, as it seems furnished to great part of the soil, all that is necessary to it, for the present. But the department of the North still receives lime, marl, or ashes, every where, or nearly so, where lime is not a component ingredient of the soil. They distinguish in this country two kinds of liming. The first [*chaulage foncier,*] consists in giving to the soil every 10 or 12 years, before seed time, four cubic metres, or 40 hectolitres of lime to the hectare.* They often mix with the slaked lime, ashes of dead coal, or of peat, which enter into the mixture in the proportion of from a third to a half, and take the place of an equal quantity of lime. The other mode of liming [*chaulage d'assolement,*] is given in compost, and at every renewal of the rotation, or upon the crop of spring grain. It is also in regular use in this country, still more than in Belgium, upon the meadows, on cold pasture lands, which do not receive the waters of irrigation. It warms the ground, and increases and improves its products. The older the compost is, the greater its effect, which lasts from 15 to 20 years, at the end of which time the dressing is renewed.

14. The limings of Normandy, the most ancient of France, are kept up in the neighborhood of Bayeux, while elsewhere they are forbidden in the leases: however, now they go over all the surface which has need of them; but in place of being applied immediately to the soil, as in the ancient method, the lime is almost always put in compost.

Liming of La Sarthe.

15. Of the modes of using lime, that of La Sarthe seems preferable. It is at once economical and productive, and secures the soil from all exhaustion. It is given every three years, at each renewal of the rotation, in the average quantity of 10 hectolitres to the hectare,† in compost made in advance, with seven or eight parts of mould, or of good earth, to one of lime. They use this compost on the land for the autumn sowing, and placed alternately with rows of farmyard manure. This method, of which the success is greater from day to day, is extending on the great body of flat argilo-silicious lands, which border the Loire; and it would seem that this method ought to be adopted every where, on open soils that permit surplus water to drain off easily.—On very moist soils the dose of lime ought perhaps to be increased.

We would desire much to inculcate with force the suitableness, and eminent advantages, of using at the same time lime and [alimentary] manure. Here they do better still, in using at the same time a compost of lime with earth and dung. In addition, during the half century that the Manceaux have been liming, the productiveness of the soil has not ceased to increase.

16. The countries of which we have spoken, are those of France in which liming is most general. However, more than half the departments I think, have commenced the use, and in a sixth, or nearly, it seems, to be established. Doubtless, the first trials do not succeed every where. There is required a rare combination of conditions for new experiments, even when they have succeeded, to induce their imitation by the great mass. Still, successful results are multiplied, and become the centres of impulse, from which meliorations extend.

English Liming.

17. The English limings seem to be established upon quite another principle from that of France. They are given with such prodigality, that the melioration upon the limed soil, has no need to be renewed afterwards. Whilst that in France we are content to give from a thousandth to a hundredth of lime to the tillable soil, from 10 to 100 hectolitres the hectare, they give in England from one to six hundredths, or from 100 to 600 hectolitres the hectare. The full success of the method of our country might make us regard the English method as an unnecessary waste. It seems that they sacrifice a capital five, six, ten times greater, without obtaining from it a result much superior; and that without lavishing [alimentary] manures also afterwards, that the future value of the soil would be endangered, in the hands of a greedy cultivator.

We will not urge the condemnation of a practice which seems to have resulted in few inconveniencies. The abundance of alimentary manures which the English farmer gives to his [limed] soils, has guarded against exhaustion: and then, in very moist ground, they have doubtless by the heavy liming, made the soil healthy, and its nature seems modified for a long time to come; and such kinds, and where *humus* abounds, will take up a heavy dose of lime, and as it seems, always without inconvenient consequences; there is then formed there the *humate of lime* in the greatest proportion, and we will see that this combination is a great means of productiveness in the soil.*

Surface Liming

18. In Germany, where liming and marling, like most other agricultural improvements, have recently made great advances, besides the ordinary modes of application, lime is used as a surface dressing. They sprinkle over the rye, in the spring, a compost containing 8 to 10 hectolitres of lime

* 46 bushels to the acre, English or American measure.

† 11¼ bushels to the acre.

* In this passage the author distinctly affirms the truth of the chemical combination in the soil of calcareous and vegetable (or other putrescent)—or the power of calcareous earth to fix and retain enriching matter—which is maintained in the *Essay on Calcerous manures*, (pp. 30, 31,) to be the most important action of calcareous matter as an ingredient of soil.—Still M. Puvis seems to attach much less importance to this than to other agencies of lime, which are considered in the Essay as of little value in comparison. Tr.

to the hectare, fifteen days after having sown clover. Also on the clover of the preceding year, they apply lime in powder, which had been slaked in the water of the dunghill, the dose being less by one-half: the effect upon the clover and the following crop of wheat is very advantageous.

In Flanders, where they use lime mixed with ashes, it is particularly for the meadows, natural or artificial, and the application is then made on the surface.

Burning Lime.

19. The burning lime is done with wood, with pit coal, or with peat; in temporary kilns, or furnaces, in permanent, or in perpetual kilns. It is burned in many places most economically with coal, but it is not so good a manure as the lime burned with wood, because, as it seems, of the potash contained in the latter case. There are but few places in which peat is used for this purpose; however, in Prussia, they succeed with three-fourths peat, and one-fourth wood. It is, doubtless, a very economical process, and the *Societe d' Encouragement* has given in its transactions plans of peat kilns; but I know not whether the operators who received prizes for their use, have continued the practice.

The temporary kilns admit of the burning of a great quantity of lime; but the permanent kilns burn it with most economy of fuel. In the first, 5 quintals of wood, burn 4 quintals, or 1 ton, or 2¼ hectolitres of lime—and in the others, the same quantity of wood will suffice for 6 quintals, or 3½ hectolitres. But in the permanent kilns such is the expense of construction and repairs, that they cannot be justified except when kept in frequent use. Coal burns from three to four times its bulk of lime—the shape of the kiln, the kind of limestone, and that of the coal, making the difference. Hydraulic lime is calcined more easily than the common [chaux grasse.] The egg-shaped kilns for coal seem to be preferable to the conical, which are more generally met with.

Precautions to be used in Liming.

20. Whatever may be the method adopted for using lime, it is essential that, as with all calcareous manures, it should be applied in powder, and not in a state like mortar—and upon the earth when not wet. Until the lime is covered up finally, all rain upon it ought to be avoided, which reduces it to paste, or to clots: and this injures its effect greatly, and even more than reasoning can explain. It ought not to be placed but upon soil, the surface mould of which drains itself naturally [by permitting the water to pass through.] On a marshy soil, unless the upper layer has been well dried, or in a very moist soil, from which the surface water does not sink or pass off easily, the properties of lime remain as locked up, and do not make themselves seen, until by new operations, the vegetable mould has been drained and put in healthy condition.

On an argillaceous and very humid soil, the use of marl, which is applied in great quantities, is preferable to that of lime, because that it can have a more powerful effect in giving the deficient health to the surface mould. On soil of this kind, a deep ploughing is a preliminary condition, essential to the success of either liming or marling: because in increasing the depth of the tilled soil, we increase also the means of putting the surface into healthy condition.

21. To secure the effect of lime on the first crop, it ought to be mixed with the oil some time before the sowing of the crop: however, if it is used in compost, it is sufficient that the compost may have been made a long time previously.

Lime, whether alone, or in compost, spread dry upon the soil, ought to be covered by a very shallow first ploughing, preceded by a slight harrowing, in order that the lime, in the course of tillage, may remain always, as much as possible, placed in the midst of the vegetable mould.

Lime, reduced to the smallest particles, tends to sink into the soil. It glides between small particles of sand and of clay, and descends below the sphere of the nutrition of plants, and stops under the ploughed layer of soil: and when there in abundance, it forms by its combinations a kind of floor, which arrests the sinking water, and greatly injures the crops. This is an inconvenience of lime applied in heavy doses, and is hastened by deep ploughing.

[To be continued.]

HORTICULTURAL SOCIETIES AND AGRICULTURAL FAIRS.—We take the following account of the meeting of the Ontario and Wayne counties Horticultural Society, from the Geneva Courier. The meeting was held at Blossom's Hotel, in Canandaigua, on the 30th of September. We omit the list of premiums, giving merely that part of the proceedings which may be of service to others; and we would call especial attention to the statement made by Mr. Samuel M. Hopkins, in relation to the "*nature* and *cause* of *Mildew*" of the Grape—it will at least be found interesting, and we hope valuable to our wine growing friends.

The fruits, vegetables, and flowers were arranged for exhibition, on tables in the dining-room of the hotel, the walls and ceiling of which had been dressed and decked in a very tasteful way, by the excellent gardeners in the employ of Messrs. Greig, Duncan, and Blossom, with a drapery gathered from forest, orchard, and garden, beautifully appropriate, and variegated with the rich dyes of autumn, among which, hung up at various intervals, were seen double pears, twin plums, apples in great clusters, and other anomalies of vegetation.

The committee were engaged in their examinations and in adjudging premiums, from about 12 till a little after 1 o'clock, and the premiums were announced after dinner.

After this report, Mr. Hopkins gave an exceedingly interesting statement of various experiments, which he had made during the past season, on the management of grape vines, with a special reference to the ascertainment of the *nature* and *cause* of *Mildew*. The statement was wholly oral, and it is impossible to give a full and exact report of it here: though the general conclusion, which Mr. H. drew from his experiments, was that the *mildew of grapes* was analagois to the *rust of wheat;* that is, an exudation, or oozing out, of the juice of the young grape through its tender skin, bursts in the very early stages of its growth, by excessive stimulation by *too high manuring*, and then acted on by the *intense heat of our American summer sun*. Mr. H. had examined the grapes, in all stages of their progress, with a microscope, and was entirely convinced that he was right, as to the *nature* of mildew, and believed that he had ascertained *one* of its causes, if not its only one. He exhibited samples of clusters, taken from different parts of his vines, to illustrate his positions and exemplify the effects of his different modes of management. He considered that the treatment, indicated by his experiments, was to avoid high manuring, and to prune little, or none, so as to leave to the clusters the shelter of all the shade the vine can furnish, and even to train the vines on trees for the sake of additional umbrage, as the custom has always been in Italy. On this point, Mr. H. referred to the natural habits of the grape, and to the methods of culture pursued in the more sunny regions of sunny Europe, and thought that our modes of treatment should be drawn from those climates, as being more like our own, rather than from countries many degrees north of us, as England and Scotland, where the humid, chill, and unsunned atmosphere about the vines, rendered much stimulation and pruning necessary.

Such is a very succinct, but, it is believed correct, outline of the views presented by Mr. H. Before the society adjourned a resolution was passed, requesting Mr. H. to furnish a detailed and full statement of his experiments and views on this subject for the press.

The following are the officers for the ensuing year:

John Greig, President; Samuel M. Hopkins, Wm. H. Adams, Oliver Phelps, Wm. S. De Zeng, Alexander Duncan, Abraham L. Beaumont, Vice Presidents; Joseph Fellows, Treasurer; O. L. Holley, Corresponding Secretary; Z. Barton Stout, Recording Secretary.

The Corresponding Secretary was directed to prepare a circular on behalf of the Society, and have 300 copies printed, for distribution in the counties of Ontario and Wayne, in the hope of enlarging the numbers of the Society and extending its usefulness.

It was resolved that the next June meeting be held at Lyons, and that Wm. H. Adams be Chairman of the Committee of Arrangements for said meeting, the day and place of which to be seasonably advertised in the newspapers.

Z. BARTON STOUT, Rec. Sec'y.

AGRICULTURAL CONVENTION.

Believing that important benefits may result from the deliberations of a State Agricultural Convention—that a moderate appropriation of public money, to induce emulation, to reward merit, and to diffuse useful knowledge in the arts of productive labor, would tend essentially to advance our prosperity, and to improve and elevate the character of our State; and knowing that the concert of many can alone insure success in the most laudable undertaking,—the subscribers respectfully invite a convention of gentlemen, desirous of giving a new impetus to agricultural improvement, either individually, or as delegates from towns and counties, at the City Hall, in Albany, on the second Monday in February next.

J. H. Bronson,	O. Wiswall,
Calvin M'Knight,	Joab Centre,
Alpheus Green,	W. R. Ludlow,
M. Sterling,	Carroll Livingston,
Wm. Smith,	Peter Livingston,
Eli Fairwell,	Sherman Griswold,
Olney Peirce,	Erastus Pratt,
Egbert Ten Eyck,	Geo. M'Kinstry,
Hart Massey,	Abm. Jordan,
Of Jefferson Co.	James Fleming,
Thos. L. Davis,	Henry Smith,
Thos. Taber,	Seymour Smith,
Henry Swift,	John Sanders,
Barton White,	Walter Patterson,

Egbert Carey,	Robert Denniston,
Benj'n Haxtun,	*Of Columbia Co.*
Ob. Titus,	Erastus Corning,
Joseph J. Jackson,	J. K. Paige,
Stephen Thorne,	Wm. Campbell,
Henry A. Livingston,	Aaron Thorp,
John Wilkinson,	Samuel Cheever,
Of Dutchess Co.	*Of Albany Co.*
J. P. Beekman,	G. Robinson,
L. Van Buren,	Wm. Main,
J. S. Vasburgh,	M. Whiting,
P. J. Hoes,	C. Murdock,
W. Hawley,	Earl Stemson,
Thos. G. Waterman,	John H. Steele,
Of Broome Co.	*Of Saratoga Co.*
G. Corning,	Dan. Bradley,
Philip Viele,	*Of Onondaga Co.*
A. Walsh,	G. D. Burrall,
Of Rensselaer Co.	*Of Ontario Co.*
L. F. Allen,	J. B. Yates, *of Madison.*
P. B. Porter,	T. H. Hubbard,
Aug. Porter,	J. W. Brewster,
Of Erie Co.	*Of Oneida Co.*

AGRICULTURAL CONVENTION.

It will be seen, by the notice inserted in to-day's Cultivator, that an Agricultural Convention is proposed to be held in Albany, on the second Monday in Feb. next.—The notice has appended to it the names of many highly respectable citizens, to whom the proposition was submitted—enough to give to it all the weight and consequence which is desirable in a preliminary measure. This is the era of conventions; and when their object is praiseworthy, they are seldom otherwise than beneficial. They tend to bring about a concert of action, and to concentrate the energies of many for the accomplishment of a common good. And if the agricultural community can in this way do any thing to advance *their* interests, we may rest assured that the *State* will be benefitted, so intimately is the prosperity of the first identified with that of the latter. The discreet farmer must graduate the extent of his purchases from the merchant, manufacturer, &c., by the net profits of his farm. If he can double these profits, as we feel assured may be done, the other classes of society will be correspondingly benefitted.

There are many topics which present themselves as worthy the consideration of an Agricultural Convention, and in which the whole community have a deep interest. We will endeavor to point out some of the more prominent ones.

1. *The establishment of a School of Agriculture.* "It remains to us," says Chaptal, "to improve agriculture by the application of physical science. All the phenomena which it presents, are the consequences necessarily resulting from those eternal laws by which matter is governed; and all the operations which the agriculturist performs, serve only to develope or modify these causes. It is, then, to the acquisition of a knowledge of these laws, in order to calculate their effects, and modify their action, that we ought to direct our researches." These laws relate not only to the organic and ponderable matters with which we have to do, as animals and vegetables, earths and manures, but to light, heat, and moisture, which exercise a controlling influence over animal and vegetable life. "Discoveries made in the cultivation of the earth," it is well remarked by Davy, "are not merely for the time and country in which they are developed, but they may be considered as extending to future ages, and as ultimately tending to benefit the whole human race; as affording subsistence for generations yet to come; as multiplying life, and not only multiplying life, but likewise providing for its enjoyment." And if the sciences, as is often asserted, are worthy of our ardent pursuit, merely on account of the intellectual pleasures they afford—"by enlarging our views of nature, and enabling us to think more correctly with respect to the beings and objects around us,"—how much more worthy are they of our regard, when employed to multiply the products and profits of human labor—to increase the comforts and happiness of the human family.

But it is not desired to make mere scientific farmers, but intimately to blend the practice, and the *best* practice, in all the departments of rural labor, with the theory, and to test and correct the one by the other. In the plan of a school which has been partially promulgated, it is set down as an indispensable rule, that during the seven farming months, both teachers and students shall devote at least one half of the time to the *practical* labors of the field, the garden, or the mechanic's shop. The plan has been objected to on the ground, that few, comparatively, can become its inmates. The same objection exists to all our higher literary schools; not one individual in five thousand receives instruction in our colleges; and yet it would subject one to ridicule to contend, that these colleges do not exercise a highly salutary influence, indirectly, upon the best interests of the community. So of our canals and public improvements; they do not directly benefit property where ample facilities of commercial intercourse previously existed—they have in fact comparatively and seriously diminished the value of real estate in some districts; yet no one doubts their utility to the community at large. Besides, should the predictions of the usefulness of agricultural schools be verified, schools of the kind can be readily multiplied.

The pupils of an agricultural school would not only carry with them into business life, those principles of science, and that general knowledge, which would be calculated to improve our husbandry, and to add to the stock of general knowledge—but they would carry with them, and disseminate, *practical* knowledge, in all the departments of agricultural labor. They would carry with them a knowledge of the various breeds of farm stock, of their relative value—of the diseases to which they are incident, and the methods of treating them, when well or sick—a knowledge of the nature and proper management of different manures—of the principles and methods of draining and irrigation—of the principles and value of alternating crops—of the best varieties of fruits and culinary vegetables, and the modes of propagating, cultivating and preserving them—a knowledge of all new plants, profitable in our rural culture, method of treatment, the soils to which they are adapted, and mode of preparing for market—of the leading principles of mechanical science, highly essential in the construction and management of farm implements. They would carry with them, also, habits of application and reflection—hands inured to labor, and minds imbued with light and truth, and animated with an ardent desire to obtain distinction for usefulness. The example of a *good* farmer exerts a magic and benign influence upon all around him. *His* light is not hid under a bushel; but shines forth to illuminate and instruct all who are within its influence. Who will set bounds to the benefits which would result from annually locating one or two hundred *such* pupils in various parts of the State?

2. *The standard of instruction in our common schools should be rated, to fit the pupils for the high duties and responsibilities of freemen, and to aid them in their future business of life.* This is required, as well by political and moral considerations, as by a desire to keep pace, in the arts of labor, with the improvements of the age. The preservation of our civil rights depends upon the intelligence and independence of the middle class of society—the pecuniary prosperity of our State upon their habits of profitable industry. It is in our common schools that we are to lay the foundation of this intelligence and independence, and to inculcate principles and habits of useful industry.

The reports from our penitentiaries furnish us with two remarkable facts, viz., that of 180 convicts, in the Connecticut state prison, "*there is no one who, before his conviction, could read and write, and who was of temperate habits, and followed a regular trade*"—and that "*there never has been, in that prison, a convict who had received either a collegiate or classical education.*" Volumes could not enforce more strongly the propriety of adopting a high standard of common school instruction, nor urge stronger considerations for multiplying incentives to honest labor. These matters come within the special province of the agricultural class, who must, from their numbers and influence, give the impress to our character, so long as our freedom shall survive. How little is now done in our common schools to instruct the boy in his future business of life, or in his civil rights and responsibilities!

The importance of the middle class of a population, under a free government, is forcibly shown in the following extract, which we make from Sismondi's History of the Fall of the Roman Empire.

"But one effect," says this historian, "of the long duration of states, and of their extended power, is to separate the inhabitants into two classes, between whom the distance is constantly widening, and gradually to destroy the intermediate class, together with which all the social virtues are gradually uprooted and annihilated. From the time that this gulf is once opened between the two extremes of society, every successive revolution does but continue to widen it; the progress of wealth had been favorable to the rich, the progress of distress favors them still more. The middle class had been unable to stand the competition with them during prosperity; in adverse times it is crushed under those calamities which only the wealthy can stand against. The corruption of Rome had begun from the time of the republic, *from the time that the middle class ceased to impress its own peculiar character on the whole nation;* this corruption increased in proportion as the intermediate ranks disappeared; it was carried to the highest pitch when the whole empire consisted of men of enormous wealth, and populace.

"It is, in fact, in the middle classes that the domestic virtues, — economy, forethought and the spirit of association,—mainly reside. It is in them that a certain degree of energy is incessantly called into operation, either as a means of rising, or of keeping the position already acquired. It is in them that alone the sentiment of social equality, on which all justice is based, can be kept alive. We must see our equals, live with them, and meet them daily and hourly, encounter their interests and their passions, before we can get the habit of seeking our own advantage in the common weal alone. Grandeur isolates a man; vast opulence accustoms each individual to look upon himself as a distinct power. He

feels that he can exist independently of his country; that his elevation or his fall may be distant; and, ere long, the servile dependents, by whom a man who spends as much as a petty state is sure to be surrounded, succeed in persuading him that his pleasures, his pains, nay, his slightest caprices, are more important than the welfare of the thousands of families whose means of subsistence he engrosses.

"The morality of a nation is preserved by associating its sentiments with all that is stable and permanent; it is destroyed by whatever tends to concentrate them on the present moment. So long as our recollections are dear to us, we shall take care that our hopes be worthy of them; but a people who sacrifice the memory of their ancestors, or the welfare of their children, to the pleasure of a day, are but sojourners in a country—they are not citizens."

3. *A portion of public money may be usefully applied in aid of county agricultural societies, to call forth talent and to excite industry.* Of the salutary effects of premium rewards, for skill and enterprise in agricultural improvement, we have testimony enough in the experiment which our State made in 1817, and which is yet exerting a beneficial influence among us. We see it confirmed also in the States which surround us, some of which have for a long time been liberal of their funds to this object, while others, yet in their infancy, have recently began to copy the provident example. There is no country which has made greater advances in improved husbandry, during the last fifty years, than Scotland, and there is none perhaps which now excels her. Her Agricultural Society has been in existence about fifty-one years, and in that time has distributed, to the tillers of the soil, premiums to the value of about half a million of dollars. The value of her agricultural products has been augmented, in the mean time, several millions annually. Who will deny, that her premiums have contributed largely to bring about this wonderful improvement in Scotch husbandry? The remarks of Chaptal upon this subject, inserted in our October number, are so pertinent and forcible, that we beg leave to refer to them, as further illustration upon this head.

4. *We want better Common Roads.*—The existing laws are defective, or they are not faithfully executed. Nothing tends so rapidly to improve and enrich a district, as good roads. The profits of agricultural labor, as well as the stimulants to industry, are increased by every new facility for transporting its products to market. The attention of our legislatures has been so much engrossed by party politics, private claims and monied incorporations, as to leave little time to deliberate upon the matter, and to digest a better system. In truth, a goodly portion have been strictly political or professional gentlemen, whose study has been more to improve *the road to office*, and the *road to preferment*, than the common roads of the farmer. Plans of improvement have been suggested, and we are advised that some of these will probably be submitted.

5. We have a formidable enemy in the *Canada Thistle*, which it requires the united efforts of all landholders to put down, aided by legal penalties. Lastly,

6. The serious depredations of the *Grain-worm* upon the wheat crop of some districts, and the apprehended danger that it will extend itself over the State, is a matter highly worthy the consideration of an Agricultural Convention.

We have thus suggested some prominent subjects which may engage the attention of an Agricultural Convention, of manifest importance to the farmer and the public. Whether all or any of them will be discussed, it is not our province to say. And we will close our already too protracted remarks, by calling upon the agricultural interest in the several counties to weigh the matter with all deliberation, and if they concur with us in the belief, that much good may result from the proposed meeting, to give it their cordial and efficient support. We would in particular address those who are just entering upon the stage of business life—who are anxious not only to acquire fortunes, but reputations for public usefulness, and who are to give a character to our agriculture in coming years. "Nothing," said an ancient sage, "can be more despicable than an old man, who has no other proof of having lived long in the world than his age." "It should be the object of our ambition that we should all signalize the period of life allotted to us, by some exertion, either mentally or bodily, which may be useful to mankind, and give us a claim to their remembrance, to their respect, and to their gratitude."—[Cultivator.]

The following short treatise on the Management of a Kitchen Garden is from the pen of Charles F. Crosman, a member of the Society of Shakers. In it will be found much that is useful, at least to some of our readers.

MANAGEMENT OF A KITCHEN GARDEN.

Previous to commencing the work of the garden, a few matters essential to success should be particularly attended to. In laying out a garden on an oblong form, it will generally be found most convenient to have the rows of vegetables run lengthwise of the garden, so that the plough or cultivator may run through freely, without interruption, allowing an alley at each end for the horse and plough to turn round upon: The ground should be ploughed or dug to a good depth, especially for long rooted plants, and be well incorporated with rotten manure or rich compost. The essential advantage of deep ploughing is not only best calculated to give room for the roots to expand freely, but the crops on a deep ploughed soil will be much less liable to injury from the extremes of wet and dry weather. Every garden should have a good supply of well rotted manure or old compost, ready for use when wanted; also a portion of soot, tobacco dust, ashes and lime, for the purpose of scattering over seed beds and hills of plants in dry weather, to destroy insects, which often cut off the young plants as fast as they come up.

The next matter of importance is, to work the ground and put in the seed when it is in proper order to receive it. A light, sandy soil will be benefitted by working it when moist, as this will have a tendency to make it more compact, and better adapted to retain its moisture; but if a clay soil be worked when too wet, it will become hard and stiff, and not only prevent the seeds from rising freely, but materially injure the plants in their subsequent growth. Rolling or pressing the earth over the seeds, will tend greatly to promote their vegetation, especially when the soil is loose and dry: but when moist and heavy, if done at all, it should be done very lightly.

If the ground be very dry at the time of sowing, let the seed be soaked a few hours in water strongly impregnated with sulphur or soot, and keep the ground moist by frequent watering: This will have a great tendency to forward the vegetation and prevent the ravages of insects.

Transplanting is generally attended with the best success when performed immediately after the ground has been newly ploughed or dug; as it will then work light, and the moisture arising from newly stirred ground is highly beneficial to the growth of young plants. If the soil of the bed be dry when the plants are to be taken out of it, let it be watered freely, and then raise the plants carefully with a trowel or a flat-pointed stick; and before setting them out, dip the roots into a mixture of rich mould or rotten manure and water, with the addition of a little lime or ashes, and reduced to the consistence of thick whitewash. This preparation is found highly beneficial to the young plants of cabbage, turnips and others when transplanted, by promoting their growth and preventing their roots from being injured by destructive insects. In setting young plants, the earth should be pressed a little over the roots, and raised around the stem, sufficient to support the plant, and prevent it from falling or leaning aside. The ground should be stirred often, and kept loose and light by frequent hoeing through the season.

A good garden, well supplied with useful vegetables, in a healthy, thriving state, kept neat and clean from weeds, affords a striking evidence that the cultivator possesses a good portion of wisdom and economy, and is attentive to his business; but when I see a garden containing a small quantity of such as are evidently from good seed, promiscuously planted, without order or regularity, faintly struggling among the weeds for existence, I readily conclude that the proprietor's mind needs cultivation, and that some noxious weeds of domestic or foreign growth have taken deep root there, which will require the strong hand of an industrious and persevering cultivator to eradicate.

The numerous benefits afforded to a family from a well cultivated garden are too little considered by many of our country farmers, for their own interest and the health and prosperity of their families. The cheap and healthy varieties which may be furnished, (much less expensive, and far more healthy than the same quantity of meat without vegetables,) the pleasing and healthy exercise and enjoyment attending their cultivation is beyond description: indeed the cultivation and produce of a good garden are the life and health of a family, upon every prineiple of rational enjoyment and temporal economy.

1. *Asparagus. F. Asperge. S. Esparrago.**—This is a very delicious vegetable, and easily cultivated, after the first operation of preparing the ground. It requires some of the deepest soil in the garden; a rich, sandy loam is the best. The ground should be trenched or spaded up, and a plenty of rotten manure well mixed into the soil to the depth of one foot and a half. Then mark out your beds six feet wide, forming two feet alleys around them, by throwing up six inches top soil on the beds. Next use the rake and hoe, till the ground is well pulverized and made level and smooth. Then mark out your drills one foot apart and two inches deep. Soak the seed twelve hours in warm water; drop it about one inch apart in the row; rake it in, and press the soil over the seed with a board

* The French and Spanish names of the various vegetables are added to our common English name, and marked with the letters F. and S., for the information of foreigners who purchase our seeds.

or garden roller. When the young plants are up, hoe them carefully, and keep them clear of weeds through the season. After the second hoeing, pull out the weakest plants, leaving them about four inches apart.

A bed of asparagus, well managed, will produce buds fit for cutting the third spring after sowing. The buds should be cut one inch or more below the surface of the ground. The cutting may be continued until the first of July; then let it grow up, but hoe it frequently till it covers the ground.

Spring dressing. As soon as the ground is dry, so as to work light, separate the stalks from the ground with a hoe, cutting them off beneath the surface, and loosen the surface of the ground all over the beds. Some dry straw, little or fine brush may be added to these stalks when dry, and the whole burnt together on the ground. This will promote the growth of the asparagus, and destroy many insects' eggs, seeds of weeds, &c. The ground should then be covered one inch or more with rotten manure or compost, well incorporated with the soil above the roots; then rake the beds smooth and level. An application of swamp earth, salt or brine spread on the beds, has been found to promote the growth of asparagus.

Though this vegetable grows naturally in a poor, sandy soil, yet the sweetness and tenderness of the buds depend much on the rapidity of their growth, which is greatly promoted by richness of soil and good attendance. Beds of asparagus may be formed by preparing the ground, as before stated, and transplanting the root of two or three years' growth, setting them with the crown upwards, four inches below the surface.

A good bed of asparagus, if well attended to, will flourish many years; ours occupies one-eighth of an acre of land, the greater part of which has been planted more than forty years, and is now as good as ever.

Directions for cooking asparagus. Cut the buds when from three to six inches high; clean them well in cold water, cutting off most of the white part, as that which grows beneath the surface of the ground is apt to be tough and bitter. Take water enough to cover the stalks, and put in salt sufficient to season them well; boil and skim the water, then put in the asparagus. Be careful to take them up as soon as they become tender, so as to preserve their true flavor and green color; for boiling a little too long will destroy both. Serve up with melted butter or cream.

2. *Beans. F. Feve. S. Haba.*—A dry, warm soil, tolerably rich, is the best for beans. The ground should be worked fine and mellow. Plant, for early use, from the 20th of April to the 1st of May. The early kinds may be planted in drills two and a half feet apart, and at the distance of three inches in the row, or in hills a foot apart.

The *Early Purple* is the earliest bean, and consequently preferred for early use. The *Early China* and *Early White* are excellent, either for stringing or shelling: they will be fit for use, if the season is favorable, in about six weeks for planting. The *Royal White* is a large, rich bean, excellent for shelling. This kind should be planted in rows three feet apart, and if in hills, two feet from each other, with four beans in a hill; if in drills, six inches apart in the row. The *Running* or *Pole Beans* should be planted in hills, three and a half feet distant each way. They should be planted as early as possible, in a rich, mellow soil. We prefer setting the poles before planting. For this purpose we stretch a line, and set the poles by it; then dig and loosen the earth, and drop five or six beans in a circle round the pole, about three inches from it, and cover with mellow dirt one inch or one and a half in depth. When the plants are well up, stir the earth around them, and pull out the weakest plants, leaving three to each hill. This should be done when they are perfectly dry; for beans never should be hoed when wet, nor when any dew is on them.

The green pods of beans may be kept and preserved fresh by laying them down in a jar or tub, with a layer of salt between each layer of beans.

3. *Beet. F. Betterave. S. Betarraga.*—Prepare your ground as early in the spring as it will work light and mellow, by ploughing or digging to the depth of eighteen inches. A deep rich soil produces the finest roots. If a small bed of the earliest kinds is sown as early as the season will admit, they will be fit for use in June. After making your beds fine and smooth, mark out the drills eighteen inches apart, and one inch deep; drop the seeds along the drills, two inches apart; cover them, and press the soil a little over the seeds. When the plants are up and sufficiently strong, thin them to the distance of six inches apart in the rows. The ground should be often hoed round the plants, and kept free from weeds. Beets for early use, should be sowed about the first of May; for winter use, two or three weeks later, the beds kept clean through the summer, and the roots taken up before hard frosts in the fall. Care should be taken in cutting off the tops, not to injure the crown.

A good method of preserving beets fresh through the winter is, to lay them in a circular form on the bottom of the cellar, with the roots in the centre and heads outward; cover the first course of roots with moist sand; then lay another course upon them, and cover with sand as before, and so on till all are packed and covered.

The *Mangel Wurtzel* and *Scarcity Beet*, also the *Yellow Swedish* or *Ruta baga* turnip, are often raised to great perfection by field culture, for which we give the following directions:

Field culture. Select a deep mellow soil; if not sufficiently rich, make it so with well rotted manure, thoroughly mixed with the soil to the depth of a foot or more. This should be done by ploughing and harrowing when the ground is in good order to work light and fine. You may then throw up moderate ridges with the plough, about the distance of three feet apart. Pulverize and level the top of the ridges with a rake. Then, with a dibble or with the fingers, make holes on the centre of the ridge, two inches deep, and eight inches apart; and for beets, drop two seeds in each hole, and cover with fine dirt, pressing it a little over the seed. For the Swedish or Ruta baga turnip, we generally prefer sowing the seed in a bed of light, mellow soil, from the 1st to the 10th of July. After having attained a sufficient size for transplanting, the ground being prepared as above directed for beets, set the plants about ten inches apart in the row; while the plants are young, the ground should be often stirred around them, and kept clean from weeds through the season. The horse plough should be often used between the rows, especially in dry, hot weather.

The average crop of these roots, on good land, with proper management, is about fifteen tons to the acre. The quantity of seed required for the mangel wurtzel or scarcity beet, is about four pounds to the acre: for the Ruta baga or Swedish turnip, about one pound and a half. To quicken vegetation, the beet seed in particular, should be soaked twenty-four hours in the water.

There are various methods of field culture recommended and practised by different people. Some sow the seed broad cast: others in rows on level ground, from ten inches to four feet apart: some sow or transplant on moderate ridges, and others on very high ridges. But those who have had most experience in this branch of agriculture, will doubtless find their own experience and judgment the most successful guide; and those who have not, may follow the directions we have given, with such deviations as the nature, situation and circumstances of their soil, according to their best judgment, may require; and experience will doubtless prove the best teacher in the end.

These roots are highly and justly recommended for feeding milch cows in the fall and winter, & especially in the spring, if well preserved; also for fattening beef and pork. If fed in the raw state, they should be cut fine; if boiled, a little Indian meal or bran may be mixed with them.

4. *Cabbage. F. Chou. S. Col.*—This vegetable requires a light, rich, and rather moist soil. The seed may be sown about the middle of May, either in a bed for transplanting, or where they are intended to grow. The transplanting should be done when the ground is light, just before a shower, or in cloudy, moist weather, but never when the ground is wet and heavy. Before transplanting, dip the roots into a mixture made of rich mould and water. They should be hoed often while young, at least twice a week; the best time for hoeing is when the dew is on. If lice should appear on the plants, wet them with a strong decoction of tobacco, put on with a small brush, or rubbed on with the hand.

Cabbage should be secured before very cold weather, and their roots buried in the dirt; but never let them rot in a cellar under your dwelling house, unless you wish to destroy the health of your family.

5. *Cauliflower. F. Chou fleur. S. Coliflor.*—This requires the best of rich, light soil. The early kind is most suitable for this climate. It should be sown about the 20th of September, for spring use; and it requires much care to keep them during the winter. For fall use, they may be sown in a hot bed in March, or in the open ground about the 20th of May. They should be protected from the northwest winds by walls or hedges, and great pains must be taken in every stage of their growth, as the extremes of heat and cold operate very unfavorably upon them.

To cook Cauliflower. Cut it when close and white, and of a middling size; cut the stem so as to separate the flower from the leaves below it; let it lie in salt and water a while; then put it into boiling water, with a handful of salt. Keep the boiler uncovered, and skim the water well. A small flower will require fifteen minutes boiling—a large one, about twenty. Take it up as soon as a fork will easily enter the stem: a little longer boiling will spoil it. Serve it up with gravy or melted butter.

5. *Carrot. F. Carotte. S. Zanahoria.*—The long orange or red is generally preferred, both for garden and field culture: the short orange is the earliest and deepest color.

Soil. Carrots require a light, mellow soil, with a mixture of sand. The ground should be dug or trenched deep, and well broken up, in order to give plenty of room for the roots to penetrate into the soil; it should also be made fine, smooth and level.

Sowing. As the seeds have a fine, hairy

furze on the borders or edges, by which they are apt to cling together, they should be well rubbed between the hands in order to separate them. To forward vegetation, they should be soaked in warm water about twenty-four hours, and then mixed with dry sand, so as to separate them as much as possible in sowing. They should be sowed in a calm time, and scattered as equally as possible.

The seed should be sown in drills about an inch in depth; the rows from eighteen to twenty inches apart, so as to give plenty of room to hoe between them. Some recommend from nine to twelve inches, and others from eight to ten: this may answer in small family gardens, where the land is scarce; but where there is a sufficiency of ground, the carrots are more easily cultivated, and will thrive better and grow larger at a greater distance.

Field Culture.—The best soil for field carrots is a deep, rich, sandy loam. To obtain a good crop, the soil should be a foot deep at least, and well prepared by very deep ploughing and thorough harrowing, so as to make the ground perfectly mellow, smooth and level. It is a matter of importance to wet the seed and cause it to swell, so as to hasten vegetation; because the weeds are apt to start very quick after sowing, and if the seed is not quickened, the weeds will get up and overpower the carrots, before they get large enough to hoe. The seed may be sown in drills, as directed for garden culture or on moderate ridges, from two to three feet apart, and cultivated between the rows with a horse plough. In hoeing, they should be thinned to three or four inches apart in the rows. Two pounds of seed is considered sufficient to sow an acre of ground in drills two feet apart.

Carrots are excellent for fattening beef, and for milch cows, horses are remarkably fond of them. When cut up small, and mixed with cut straw and given them, with a little hay, it is said they may be kept in excellent condition for any kind of ordinary labor, without any grain.

7. *Celery. F. Celeri. S. Apio.*—The *White Solid* is considered the best kind of celery. We have had the best crops by sowing the seed the latter part of March, in a hot bed. After the plants have attained the height of about six inches, they may be transplanted into trenches. Select for this purpose, a piece of rich ground, in an open exposure; lay out your trenches about eighteen inches wide, allowing six feet space between each trench; plough or spade out the earth from the trenches to the depth of sixteen or eighteen inches, if the depth of soil will admit; put about three inches of very rotten manure into the trench; then throw in upon this manure about five inches of the best soil; mix and stir the manure and soil well together; then set your plants by a line in the centre of the trench, leaving a space of four inches between each plant. If the weather be dry, water the plants freely. They should be shaded till the roots strike and the plants begin to grow; the covering should be taken off at night.

When they have attained the height of ten inches, you may commence earthing them up; but never do it while the plants are wet. In performing this, care should be taken to gather all the leaves up with the hand while drawing the earth up equally on each side of the row, being careful to leave the hearts of the plants open. Repeat the earthing once a week or oftener, till about the last week in October; then bury the whole with dirt, to remain till time of digging.

Celery may also be raised by sowing the seed in a rich, moist soil, and removing it into trenches as before directed; or by sowing it in the trenches where it is to grow. As the seed vegetates very slowly, it should be soaked, in warm water for twenty-four hours before sowing. To preserve it through the winter, dig it before the ground freezes deep, and pack it away in casks or tubs with dry sand, and keep it in the cellar.—Some recommend to cover the ridges with boards, and dig the celery as it is wanted for use. This may answer in a dry, sandy soil; but in a wet or moist soil it is apt to rot and spoil.

8. *Corn. F. Mais. S. Maiz.*—The *Early Canada* is the earliest kind of corn we raise, and is preferred only for being several weeks earlier than the common field corn. The *sweet* or *sugar* corn is the best for cooking in its green state, as it remains much longer in the milk, and is richer and sweeter than other kind. It is rather later than the common field corn, and is therefore fit for the table when the field corn has become too hard. Alluvial, or any gravelly or sandy soil, if made sufficiently rich and properly cultivated, will produce a rich crop. It should not be planted till the weather becomes settled and warm, and the soil sufficiently dry. It may be planted in hills, like the common field corn, or in a garden in drills, like broom corn; as in this way a larger crop may be produced from the same quantity of ground. Care should be taken that no other kind of corn be planted near it, as by intermixing, it will soon become adulterated and injure the crop. This corn may be preserved for winter use, by parboiling it when green, and cutting it from the cob and drying it in the sun. It then affords a wholesome and agreeable dish when cooked like bean porridge, or what is called *succotash.*

9. *Cucumber. F. Concomber. S. Cohambro.*—The early kinds are most suitable for early plantiug. For the purpose of obtaining them very early, some plant the seed in a hot bed, or in elevated hills, well manured with rotten horse-dung, and covered with glazed frames. But in order to grow fair, handsome cucumbers, the soil should be rich, light and warm, and well mixed with rotten manure; or a good shovel full may be put into each hill, and thoroughly mixed with the soil in the hill. We generally plant the early kinds about the first of May, in hills about four feet apart each way, elevating the hills a little above the level of the ground. Put in six or eight seeds into each hill, and cover them half an inch deep with fine dirt, and, as in all other planting, press the earth a little over the seeds with the back of the hoe.

When the plants are up, examine them closely, as they are frequently attacked by the yellow bug or fly. To prevent this, take rye flour, sifted ashes and ground plaster, equal parts of each, well mixed together, and dust the plants all over with it. If the plants are dry, sprinkle them with water before you dust them. Snuff, tobacco dust, or the stalks boiled in water, soot, or a decoction of elder and walnut leaves, are all very good to prevent small bugs and insects from injuring any young plants. Keep the ground loose and clear of weeds, and in dry weather, water your plants freely. After they have attained a vigorous growth, and the danger from insects is over, they may be thinned out, leaving two of the most thrifty in a hill.

Those intended for pickling may be planted from the 10th to the 20th of June. If the soil is rich and warm, the 20th is preferred. The long kinds are preferred by some for pickles. The cultivation and management of these is the same as the others, excepting that the hills should be at least five feet apart each way. Some gardeners recommend nipping off the first runner bud of cucumbers and melons, from an idea that they will become more stocky and fruitful.

10. *Lettuce. F. Laitue. S. Lachuga.*—Lettuce requires a mellow soil. It should be sown as early in the spring as possible: to insure a very early supply, it may be sown late in the fall—it will then start early in the spring; but to obtain a constant and regular supply through the season, it should be sown broad-cast, moderately thin, or in rows from twelve to eighteen inches distant, according to the usual size of the different kinds. Rake in the seed lightly, with a fine tooth garden rake. When the plants are up, stir the ground lightly while it is dry, and clear out the weeds: thin the plants where they crowd each other. Those intended for large heads should stand eight or ten inches apart: the hardy kinds, such as the *early green, early curled,* and *ice coss,* may be sown in September, and covered with straw at the approach of severe weather. Or any kind may be sown in a hot bed in March, and transplanted in the open ground at the proper season.

11. *Melon. F. and S. the same.*—This plant requires a warm gravelly or sandy soil, made very rich with well rotted manure from the hog-pen, or rich old compost, well mixed with the soil. The hills may be formed after the manner recommended for cucumbers. But if the natural soil is not sufficiently warm for melons, then dig a hole of sufficient size, and put in a large shovel full of rotten horse dung; upon this put the compost or rotten hog dung, with a quart of slacked lime: then add some good mellow soil, and mix it up well on the surface without disturbing the horse dung at the bottom. The hills may be made from six to eight feet apart: for water melons, on rich, warm land, where they grow most thrifty, nine feet is near enough.

Plant about the middle of May, if the weather be warm and the ground in good order. The seed should be soaked a few hours in warm milk and water, with a little soot in it. Put six or eight seeds in a hill, and cover half an inch deep. When the plants become strong and thrifty, so as to be out of danger, pull out the weakest, leaving only two in each hill; indeed one would always be sufficient, if secure from all accidents. The ground should be often hoed round the hills, and kept loose and light. If you would raise good melons, you must plant them remote from any other vines; for in the vicinity of cucumbers, squashes, pumpkins, gourds and the like, they will infallibly degenerate. In this respect, therefore, they require great care and attention. To secure them from the ravages of insects, pursue the directions given for cucumbers.—[See cucumber.]

[To be continued.]

TO THE LOVERS OF HONEY.—The following directions in relation to the cultivation of bees, are given by Francis Kelsey, in his treatise on the "Description, Cultivation, and Management of the Honey Bee." Some of our readers will probably recollect Mr. Kelsey and his beautiful specimens of honey, at the Fair of the American Institute.

From this work, it will be seen that honey may be cultivated in a city, as elsewhere, and we have no doubt of it, to a

considerable extent—by those who are not subjected to the inconvenience of moving annually. A suitable room may be prepared in the garret—so arranged as to afford space for the bees to increase, yet not to require them to swarm at all, and the honey taken out without disturbing them.

THE CULTIVATION OF BEES.

The cultivation of bees is by no means confined to the country, as many imagine; for they will find honey even in a paved city. They will search every yard, drain, garden, fruit tree, sugar and molasses cask, and it is but trifling for them to fly three or four miles, which they often do. It is probable they would cross water that far, if necessary; they would do well no doubt, if there was fifty to where there is but one. Every farmer might keep them; every citizen that has a small yard, might keep them; they can be kept in an upper room or loft by keeping the windows open; the roof of a building is not a bad place to keep them, in this case they need a short board on the top of each hive, with a stone or brick to keep it on, to keep the sun and water from the top of the hive. Several bushes should be erected upon the roof, or fastened to the sides of the window if they are kept in a room, for them to light upon when they swarm.

Directions for those that are unacquainted with bee-keeping. To purchase a hive of bees, place it where they are designed to stand, (this I would recommend to be done in the spring,) select a hive well stocked with bees, a two year old swarm would be advisable, little or no attention will be necessary until they begin to show indications of swarming, which will be in June, by laying out, i. e. in great clusters, outside of the hive, which they generally do ten or fifteen days before they swarm; when this is discovered, hives are to be prepared, such, if you please, as will hereafter be described as being the most advantageous. The bees are to be watched from 10 o'clock, A. M., until 3 P. M., which is the usual time in the day for them to swarm; when they swarm, they come out of the old hive with admirable and astonishing speed; they always light upon something, a bush, a bough, a tree, a post, a fence, a weed, or a plant, and sometimes, if it is windy, even upon a turf on the ground in a body; oftentimes as large as a water pail. If they are on the ground, set the hive over them, and they will soon go into it; if they are on a bush or a bough, cut it off carefully, holding it steady, carry it where you want the hive to stand, lay it upon the bottom board in front of the hive, they will go in speedily if the front be raised an inch; or if they light upon a fence or post, or the trunk of a tree, the hive may either be placed just above them, and they routed with a stick, or the hive placed beneath them bottom upwards, and they brushed off into it with a wing or broom, and then place it upright upon the bottom board, and as soon as the bees get settled, the hive should be let down to the bottom board, and placed where they are to stand, immediately before they go out to work; they ought not to be placed too near the old hive; swarms ought to be four feet apart. The second swarm may be expected in twelve days after the first; the third and fourth, if they swarm so much, within fifteen days, they sometimes swarm twice in one day, in consequence of hatching many young queens. The first swarm gives no previous symptoms, only by laying out; but after the first, you may have knowledge a day or two previous to their swarming, by listening in the evening near the hive; for there always may be heard, two and sometimes three days before swarming, a sharp, shrill sound, above, and entirely different from the humming of the common bees: this must be the young queens', of which the second and third swarms have a number; but the first swarm never has but one.

A DESCRIPTION OF PECULIAR HIVES.

As to hives, they ought to be so constructed that an addition can be put to them when it may be thought best. The plan I would recommend, both for profit and convenience, is this: have the hives all made of a breadth and square, say fifteen inches inside, and five or six in height; the common top board, which every hive is to have, must be fifteen inches square, and put within and flush with the top of the side boards; each is to have sixteen holes bored through it at equal distance from each other, i. e. four in a row each way, and not smaller than 3-4 nor larger than 5-4 of an inch, in one side, which is for the front; let, again, be cut in the bottom of each hive, for the bees to pass through, half an inch in depth and three inches in length, let two sticks the size of a man's thumb, be crowded or sprung in crossing each ether from corner to corner; these are calculated to be set one upon the other, &c., as occasion may require; the top one must always have a top board eighteen or nineteen inches square fastened upon it with a large screw well tallowed to prevent rust. After a swarm is put into one of these hives, and has it nearly full, an additional hive is to be put beneath them without a top, except the one with holes through it. I do not recommend adding before the middle of July: an addition generally prevents their swarming for that reason, and I think they had better not swarm later, for it weakens the old stock too much. When they have got three such aparments full, or nearly full, the top may be taken off in the spring or fall with safety; in such cases it is most generally destitute of bees, but if it is not, puff a little smoke under it as you raise it, which will make them flee in a hurry. A top is to be screwed on in the place of it, or, if you choose, place another hive in the room of it, or otherwise you can put four small boxes in place of it, (which had bettter be covered with another hive.) They may be of wood or glass, or, if you choose, glass globes, bottles, bowls, jars, tumblers, &c.; they may be taken off at any time when they are full, and empty ones put on, or the holes covered.

EXPERIMENTS.

In our farming operations of the past season, we have made some experiments rather out of the ordinary routine of practice, the results of which we here state, for the benefit and admonition of others.

1. We drilled in a half a pound of ruta baga seed between the rows in a field of corn, after the last dressing. On harvesting the corn, about the 13th September, but a few drawn plants of the ruta baga were found. The corn stood well and stout, 3 by 2½ feet, and pumpkin vines covered the surface. The turnips did not fail for want of nourishment in the soil, but from the absence of heat, light, and air, to elaborate this food, and to produce a natural development of the plants.

2. We drilled buckwheat between rows of China beans. We lost more in the bean crop than we gained in the buckwheat. The beans did not mature and ripen well.

3. We sowed half a pound of Aberdeen turnip seed, broad cast, after the last hoeing. The corn having been replanted, and yet thin, from the devastations of the worm, was not cut up till about the 25th Sept. On the 10th November we gathered 70 bushels of good turnips, many small ones being left, the crop not having been thinned.

3. Manured 100 rods, or five-eighths of an acre, of one year ley, from which the clover had been mown the last of June, ploughed, harrowed, and drilled in a half a pound of ruta baga seed, on the 4th July. The after culture consisted of two dressings, with cultivator and hoe, at the first of which the plants were thinned to 8 or 10 inches in the drill. The crop was taken up the 18th Nov., and the product was 350 bushels. The ground and crop were measured. The seed was drilled in by a bungler, who made the drills too distant often four feet. At regular intervals of 2½ feet the product would have been at least 100 bushels more. This practice is not new, nor is the product great; but the result is given to show the profits of *root* culture. The expense of curing the clover, of 12 loads manure, and of cultivating, harvesting and securing the turnips for winter, I estimate at $18. The product of the 100 rods may be put down as follows:

1 ton clover hay, ...	$15 00
350 bushels ruta baga, at 1s. 6d	65 62½
Tops, say, ...	1 10
	81 62½
Deduct charges, ...	18 00
Profits, ...	$63 62½

5. We burnt a strip of wheat stubble, first scattering upon it some light straw, sowed upon it the seed of the white turnip, and harrowed it in thoroughly, the 4th August. The plants were thinned with the hoe, and we gathered a fair crop of handsome table turnips.

6. We mixed pumpkin seed profusely with our seed corn. Where the corn stood well, the pumpkins were tolerably productive; where worms thinned it they grew in great abundance. We gathered from seven acres more than forty cart loads. With these, our small potatoes, and refuse apples, boiled together, and soft corn, we have put fourteen porkers in good condition for the barrel, and have enough in store to keep them thriving till the middle of December. We thus expect to make 3,000 lbs. of pork from the refuse matters, which every farm may be made to produce, and which are not marketable commodities. We put down the saving in these matters as a prominent item in the profits of a farm.—*Cultivator.*

GREAT PRODUCTS IN OHIO.

Scioto Valley against the World.—N. W. Thatcher, Esq., Secretary of the Agricultural Society, has handed us the following statement. It contains striking illustrations of the fertility of our soil, under skilful culture:

"*One hundred and fifty-four bushels of* corn, *actual liberal measure*, was produced the present season on *one measured acre* of ground, selected from a field of twelve acres, all equally as good, on the farm of Mr. George Renick of this vicinity. Mr. Felix Renick produced *eighty-five and a half bushels* of oats on an acre of ground; the seed of which he recently brought from England. The oats weigh about twelve

pounds to the bushel more than the common oats of this country. Mr. Daniel Madeira of this place, raised in his garden, Cauliflowers of most extraordinary size, measuring from 29 to 33 inches in circumference, and weighing three pounds ten ounces in *one solid head.* And a stalk of corn, in the garden of Mr. Peter Douglass, produced *eight good ears of corn!*"—[Chilicothe Adv.]

"*Premium Corn.*"—The premium was awarded to Mr. Asahel Renick, by the Agricultural Society of Pickaway county, on Monday last, for the best acre of corn. ☞ *One hundred and fifty-seven bushels and one peck!*" Let those who can, beat that. We learn from the President of the Society, that the corn was planted in hills, a little more than three feet asunder, and received no more than the ordinary cultivation. So much for Darby Creek *bottoms.* We were gratified to observe an increased interest in the Society, manifested on the part of the farmers of the county."—[Circleville Herald.]

Estimating the cost of culture at $15 per acre, and the price of corn at fifty cents per bushel, the growers of the above corn crops realized a nett profit of $62 per acre. We are not sure that the valley of the Hudson can compete with the vallies of the Scioto and Darby Creek, but we *are sure* that eighty bushels of corn per acre can be raised here, on proper corn ground, *without extra expense;* and this, at present prices, affords a profit of $65 per acre.—[Cultivator.]

HOW TO HAVE MINCE PIES ANY TIME.—Prepare your meat by boiling and chopping, as though it were for immediate use—mix it with a suitable proportion of suet, spice and salt—then put it in an earthen pot, pound it down with a pestle, and then cover it with the best of molasses, keep it where it will not freeze, and it will be fit for use any time. My wife has adopted the above course for four or five years, with perfect success; so that we have had mince pies made from meat killed in December, as constant in July following as in January, and quite as acceptable.—[Maine Farmer.]

CURE FOR A CANCER.—Mr. Thomas Tyrell, of Missouri, advertised that a cancer upon his nose, which had been treated without success by Dr. Smith, of New-Haven, and the ablest surgeons in the western country, had been cured in the following manner: He was recommended to use a strong potash, made of the ashes of red oak bark boiled down to the consistence of molasses, to cover the cancer with it, and in about an hour afterwards cover it with a plaster of tar, which must be removed after a few days, and if any protuberances remain in the wound apply more potash to them, and the plaster again, until they shall disappear, after which heal the wound with common salve. Cautery and the knife had been previously used in vain. This treatment effected a speedy and perfect cure.—[Baltimore Farmer.]

ROCHESTER EDGE-TOOLS.—Among the various branches of business now in successful operation in the city of Rochester, none are more deserving of attention than the manufacture of Edge-Tools. To such perfection is this carried, that nearly all descriptions of the article can be furnished from our manufactories with a *finish* and at a *price* which are rapidly giving them a preference over the wares of Sheffield and Brummagem. Mechanics and others who use such articles have a deep interest in enconraging our own manufactories—as thereby they can have tools *warranted* of the first quality, while the encouragement bestowed on our own artizans promotes our domestic welfare, and aids in insuring an excellent supply at reasonable prices from our own workshops.

The Edge-Tools fabricated by Messrs. *Barton & Babcock*, are creditable to themselves and to the character of our mechanic arts. All who have used them concur in their praise. The manufactory is in the stone building at the southwest corner of the main bridge across the river. They employ about twenty-five hands, on an average—consume from 12 to 14 tons of iron, 8,000 lbs. cast steel, 500 lb. of borax, 30,000 bushels of charcoal, &c. Judging from the success of the experiment which they have already made, their business will soon be greatly extended, as the excellence of their manufactures becomes as generally known as it deserves to be.

We can bear willing testimony to the correctness of the encomium passed by "RHO," on the gentlemen and articles referred to in the above notice. We speak from personal observation and inspection—and would recommend them to the patronage of the public.—[ED. M. M.]

THE LABORING CLASSES IN EUROPE.—The North American Review for October, commences a discussion of this subject, which, if the conclusion equals the present portion, ought to be circulated by thousands, as a tract, throughout the land.

The writer of the interesting article to which we have just referred, notices the condition of the laboring classes in Europe, in respect "to the rate of wages, the burden of taxation, the means of subsistence, the facilities of acquiring education, and the share, if any, which these classes have in the government." The facts, in regard to each of these particulars, ought to make those hang their heads with shame, who, in this community, talk of the oppression of the laboring classes by the rich, and of the withholding of rights from the common people.

In Norway, "the ordinary food of the peasantry is bread and gruel, both prepared of oatmeal, with an occasional intermixture of dried fish. Meat is a luxury which they rarely enjoy."

In Sweden, the dress of the peasantry is prescribed by law. "Their food consists of hard bread, dried fish and gruel, without meat."

In Denmark, the peasantry are still held in bondage, and are bought and sold together with the land on which they labor."

In Russia, "the bondage of the peasantry is even more complete than it is in Denmark." The nobles own all the land in the empire, and the peasantry, who reside upon it, are transferred with the estate.

"A great majority have only cottages, one portion of which is occupied by the family, while the other is appropriated to domestic animals. Few, if any, have beds, but they sleep upon bare boards, or upon parts of the immense stoves by which their houses are warmed. Their food consists of black bread, cabbage, and other vegetables, without any addition of butter."

In Poland, "the nobles are the proprietors of the land, and the peasants are slaves." A recent traveller says, "I travelled in every direction, and never saw a wheaten loaf to the eastward of the Rhine, in any part of Northern Germany, Poland, or Denmark. The common food of the peasantry of Poland, 'the working men, is cabbage, potatoes, sometimes, but not generally, peas, black bread and soup, or rather gruel, without the addition of butter or meat."

In Austria, "the nobles are the proprietors of the land, and the peasants are compelled to work for their masters during every day of the week, excepting Sunday. The cultivators of the soil are in a state of bondage."

In Hungary their state is, if possible, still worse. The nobles own the land, do no work, and pay no taxes. The laboring classes are obliged to repair all the highways and bridges, are liable at any time to have soldiers quartered upon them, and are compelled to pay one-tenth of the produce of their labor to the church, and one-ninth to the lord whose land they occupy.

Of the people of France, "seven and a half millions do not eat meat, or wheaten bread. They live upon barley, rye, buckwheat, chesnuts, and a few potatoes." [We saw it stated, the other day, that some workmen, we forget in what part of New-England, had a turn-out because their employers would not furnish them with tea and coffee at dinner!]

The common wages of a hard laborer, in France, is $37 50 for a man, and $18 75 for a woman, annually. "The taxes upon the land are equal to one-fifth of its nett products."

In 1791, there were 700,000 houses in Ireland. Of these, 113,000 were occupied by paupers—and more than 500,000 had only one hearth. The average wages of a laborer is from nine and a half to eleven cents a day.

Among the laboring classes of the industrious Scotch, "meat, except on Sundays, is rarely used."

In England, the price of labor varies. "The Nottingham stocking-weavers, as stated by them in a public address, after working from fourteen to sixteen hours in a day, only earned from four to seven shillings a week, and were obliged to subsist upon bread and water, or potatoes and salt!"

THE AXE.—The power of the American Axe (says Latrobe in his book on the United States), and the skill with which it is wielded, may well excite the admiration of a European. The weapon itself is no more to be compared with the vile copper commonly seen in the hands of one of our woodmen, than a gimblet can be compared to a centre bit. It is formed upon a different principle—the handle is set far forward, and it acts upon the tree, more from the wedgelike form, its own weight, and the skillful swing which gives it impetus, than from any great exertion of strength on the part of the woodman. In fact slight more than strength is employed in its use. The rapidity with which the huge trees of the forest fall before a single pair of well swung axes is really marvellous; and the axe may rank with maize and steam as one of the three things which have conquered the Western World.

A CARD.

TO THE SUBSCRIBERS AND FRIENDS OF THE

NEW-YORK FARMER, RAILROAD JOURNAL, MECHANICS' MAGAZINE, AND APPRENTICE'S COMPANION;

All of which publications have been delayed *over a month*, in consequence of the destruction by the late conflagration of the press and materials with which they were printed. The Editor and Proprietor desires to say, that they will be hereafter regularly issued, and forwarded with care and punctuality.

In consequence of the heavy loss sustained by the fire, including not only nearly all my *printing materials*, but also *nearly all* my stock of *back volumes*, *sheets*, and *numbers* of the different publications, and all of my *stereotype plates* of five volumes of the Mechanics' Magazine, I am compelled to ask the indulgence of their patrons for a few days, until I can get a new office arranged, so as to present the works to them improved both in *appearance* and in matter—and as I have relinquished the management of the business department of the New-York American, for the purpose of devoting myself exclusively, hereafter, to my publications, I hope to render them more interesting and more useful than I have heretofore been able.

I am also induced by my losses, which amount to over eight thousand dollars, to request each friend of my publications to aid in *extending their circulation*, and of each present subscriber the favor to remit the balance due, if any there be, and in advance for the year EIGHTEEN HUNDRED AND THIRTY-SIX, that I may be able to make the works worthy of increased patronage, and useful to community.

D. K. MINOR, EDITOR AND PROPRIETOR.

NEW-YORK, February 1, 1836.

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